Annual Journal of Photography

1914

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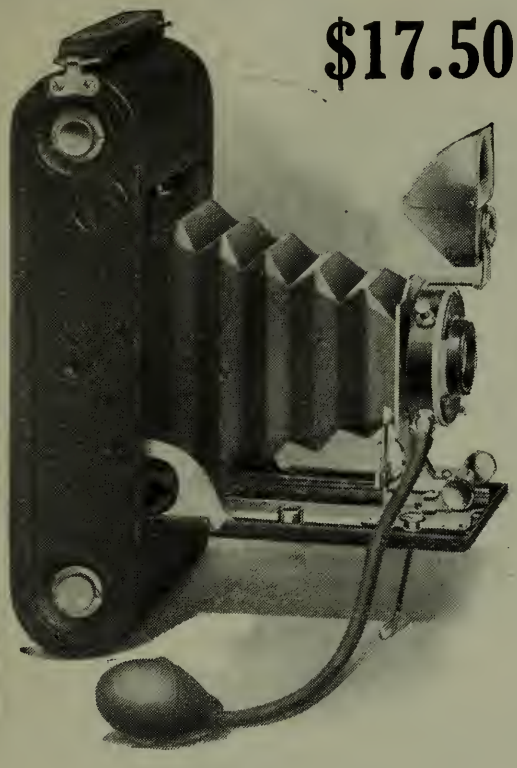
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The camera with New Plano Reversible Finder

(Patented)

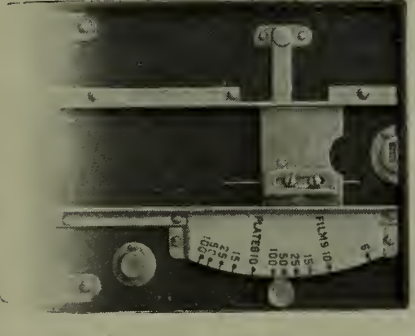
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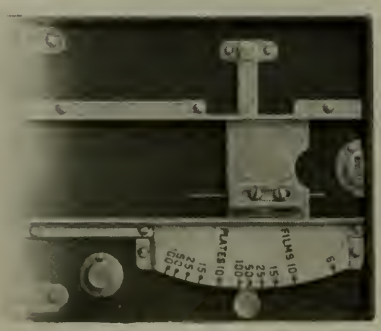
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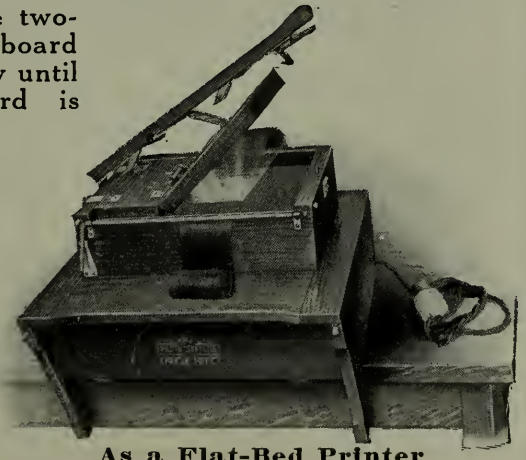
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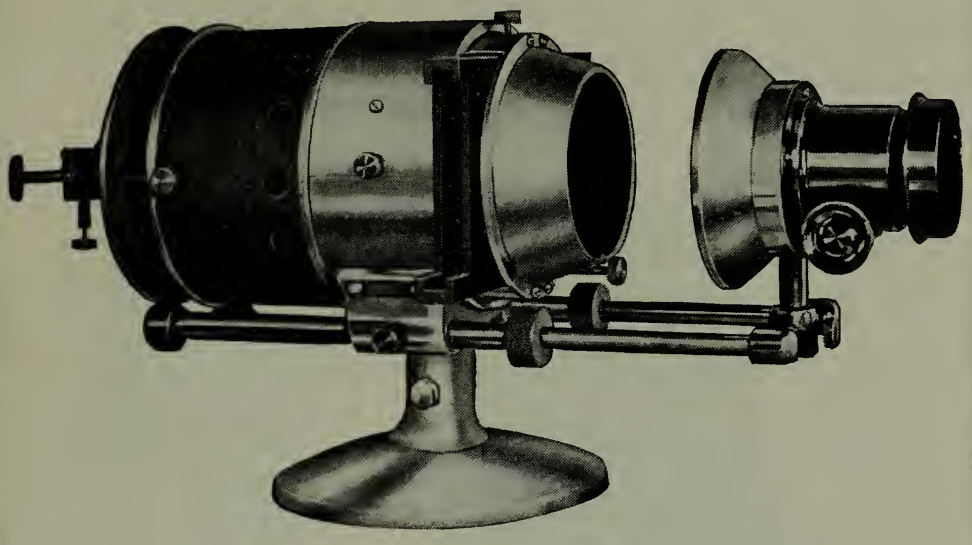
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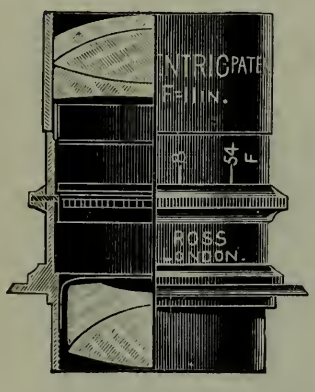
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A

The Coated Surface of Exposed Carbon Tissue (Pigmented Gelatine).

B

Single Transfer Paper.

C

Soak A and B in cold water, bring coated surfaces together in contact and squeegee.

D

Place the adherent tissue and transfer paper between blotting boards for a few minutes. Next immerse in warm water, until the colored gelatine begins to ooze out at the edges.

E

Strip off the Tissue backing paper and throw it away.

F

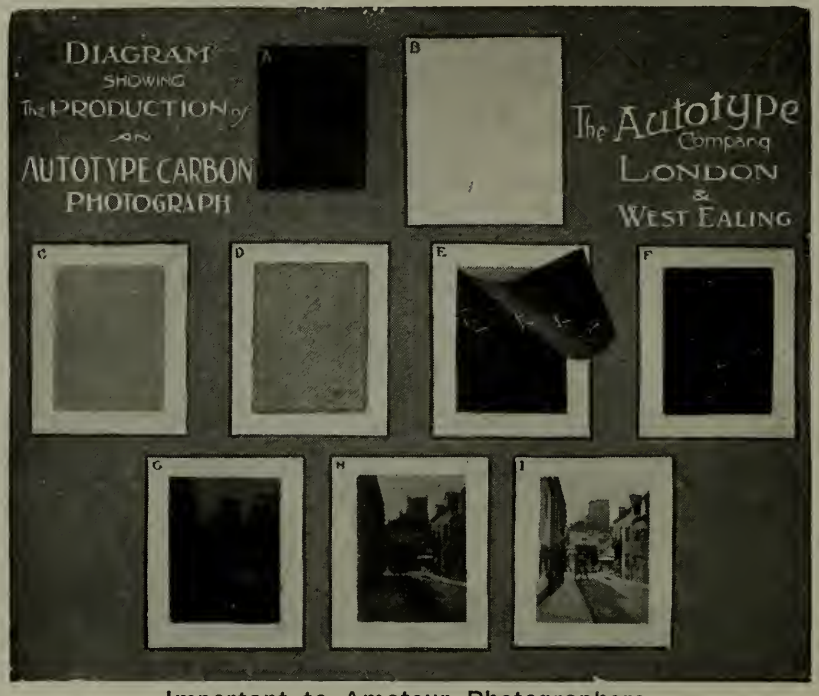
A dark mass of colored gelatine is left on the transfer paper. This remains in the warm water and the gelatine surface is splashed over until the picture gradually makes its appearance.

G and H

Continue until completed.

I

The picture is now placed in an alum bath (five per cent) to harden the film and discharge the bichromate sensitizing salt. A rinse in cold water completes the operation.



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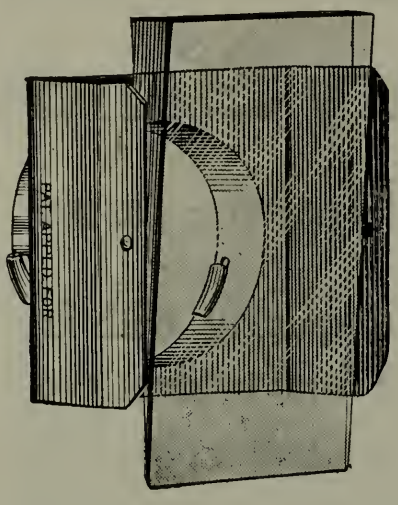
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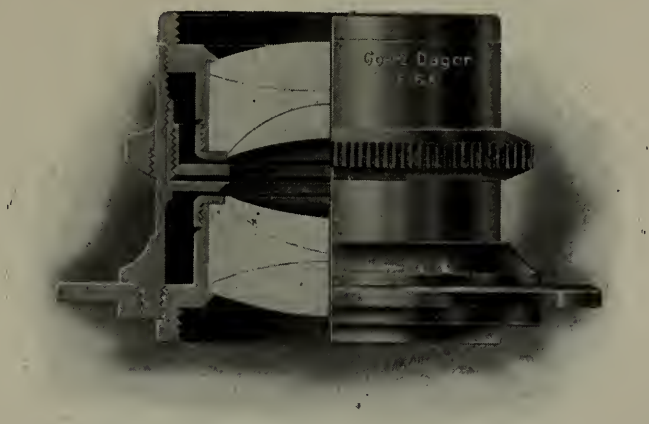
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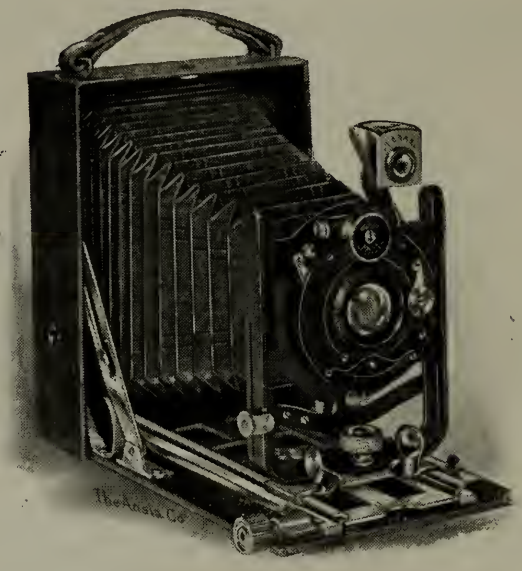
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ARTURA IRIS E ROUGH

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The American Annual of Photography 1914

VOLUME XXVIII

Edited by Percy Y. Howe



NEW YORK
THE AMERICAN ANNUAL OF PHOTOGRAPHY, INC.
MCMXIII

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PREFACE

THE year 1913, while it has shown a rapid growth in the photographic business in America, has not been productive of any startling discoveries or methods.

The increased interest and improvement in color photography, and the recent introduction of cut-films for studio work are probably the most noticeable progress of the year.

As usual the illustrations in this volume represent the best work of the year by leading camera workers at home and abroad. The contributed papers cover almost every phase of photography and contain many new and useful methods of manipulation.

Sincere thanks are given to all who assisted in the making of this book by their pictorial or literary contributions.

Lack of space prevented the including in this issue of many of the articles and prints submitted. To those whose contributions were omitted I extend my special thanks.

Every photographic worker is invited to contribute to the ANNUAL by sending an article telling of his experience or experiments in any branch of photographic work, or prints for illustration. They should be sent to the address given below any time previous to September 1st, if intended for use in that year's issue.

PERCY Y. HOWE, *Editor*

422 Park Hill Ave., Yonkers, N. Y.

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	27	28	29	30	. .	. .	. .
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July	. .	. .	. .	. .	1	2	3
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	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
Aug.	1	2	3	4	5	6	7
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THE ART STUDENT. Ryland W. Phillips.

The American Annual of Photography · · 1914

SMALL CAMERAS FOR PROFESSIONAL WORK

By G. T. HARRIS

TEMPORA *mutantur*. A few years ago the professional landscape photographer's impedimenta was, even after the advent of dry plates, of sufficient bulk to cause him a large amount of labour and worry outside the actual photographic work. My "little lot" for a six or seven months' tour, when packed and ready for the journey, scaled round about five hundred weight, and it speaks volumes for the generosity, or carelessness, of our English railway companies that only once in years of constant travelling was I charged excess luggage. Every view was taken on a 12 x 10 plate, important views on three sizes; so the field outfit alone was a really serious matter; indeed, the lenses would, of themselves, outweigh the average modern hand-camera.

Then came the post-card craze, and as it gradually grew in dimensions it elbowed the larger sized prints out of existence. Still, publishing houses, with the habit of large sized negatives clinging to them, found it difficult to break away and adapt themselves to the new departure. Nor can one wonder altogether at their reluctance to throw over the large sized negative, with its generous dimensions, and opportunities of dealing at least reasonably well with any subject that might arise. One has only to look through the average amateur's collection of prints taken with a post-card size camera to real-

ize how hopelessly impossible a shape it is from a professional photographer's point of view, and one ceases to wonder that the publishing photographer clings to the plate of fair-sized dimensions, upon which he can accommodate practically any subject he may require. This, at any rate, is my own practice in spite of every desire to lighten the field burden; so I compromise in favor of an 8½ x 6½ camera, with a change to 6½ x 4¾ for purely landscape subjects in districts entailing hard journeys.

A couple of years ago I decided on adding Dartmoor to my series of views, and spent a week in walking over the district with a folding hand-camera, ruc-sack and vasculum, making a preliminary survey. It was very obvious that to do the district as it should be done from a moors-man's point of view would be out of the question with a fair sized stand camera, unless one confined oneself to those routes and points visited by tourist conveyances. The real Dartmoor lover loathes these same routes, points and conveyances, and is never found standing on the summit of Heylor with a miscellaneous crowd of char-à-bancers. Dartmoor to him means a pathless tramp with compass and ordinance map, picking up this and that "tor," or moorland village *en route*.

Dartmoor with a stand-camera of proportions would appeal to the tripper and char-à-bancer, but he was already supplied, and over-supplied, with all kinds of views of his pet resorts. So I elected to modernize my methods, travel light and take small sizes.

To this end I had a quarter-plate folding hand camera made suitable for plates by fitting to it a special back for plate-envelopes, with focussing screen complete. This was erected for use on a thoroughly rigid tripod of good height, so that each view could be properly "placed" and focussed on the plate. Acting on a hint given in the pages of the British Journal of Photography by its editor, I chose a modern lens of good quality about 5½ inches focus, so that the best of definition might be obtained. Orthochromatic plates of about 250 H & D were used, and the filter was a good quality sealed film of stained gelatine. I felt thoroughly ashamed of the outfit from a professional point of view, and had some difficulty in persuading myself to act up to my convictions. I eased my



THE WHITE SPIRE. WILLIAM S. DAVIS.

conscience somewhat by taking with me a good well tried half-plate set, with half-a-dozen lenses.

The trip extended to five weeks, and the average day's walking was twenty miles, entailing ascents to tors 1500-1700 feet, and descents to nearly sea level in the valleys, several times a day. The course each day was more or less a map and compass course across the moor in various directions. The weather was thoroughly English. One day we sat for four hours under the lee side of a tor, the landscape blotted completely out to within six yards of our shelter by rain and mist, the cold bitter and the month July. In spite of constant adverse conditions some twelve dozen negatives were obtained during the trip, and although the half plate had been used for those views in the more accessible places the small quarter plate had the entire responsibility for those views occurring in the remote places of the moor.

It may be imagined that I was somewhat anxious over the result of what was to me quite an experiment. I had spent five weeks of valuable time, considerable money, and pounds and pounds of apparently superfluous flesh in acquiring these negatives, and if they didn't answer my expectations I had no one to blame for my disaster.

The exposures had all been most carefully timed, and I had every confidence in their correctness, as I had made trial exposures under varying conditions before leaving home and arrived at the right exposure for such subjects as I was likely to require. On my return I commenced developing the batch without loss of time, using the pyro-soda developer now so well known as the "B. J." pyro-soda formula. Six plates were placed in a tray and developed. The average time of development was six minutes, and when the first six were taken from the fixing bath I knew that I had no reason to feel further uneasiness.

The exposures were correct, and the negatives perfectly sharp and of fine quality. I took no duplicates on the journey, and every plate was usable; that is to say, several required after treatment of some kind to enable them to give satisfactory results. My paper envelopes seemed so inconsequential after long years of mahogany slides that I was constantly



SUNSET NEAR OTTERTON, SOUTH DEVON. G. T. HARRIS.

worrying on the journey about their trustworthiness, but not a trace of fog appeared on any of the plates.

The batch having been developed carbon transparencies were made by printing them in sets of four and afterwards cutting them to their correct size. The negatives required were then made by enlargement in the enlarging camera, and were satisfactory in all respects.

If there had been any falling off in quality of this Dartmoor series when compared with other series taken in the time-honored "professional" manner I should have accounted my experiment a failure. For this reason, and for my future guidance, I sat in the severest judgment on the finished product and could find it wanting in no respect. Of its market value I have fortunately no doubt. Since the publication of the series it has been in constant demand on all hands, and the verdict of the general public is after all a pretty sound one; at least when one caters for them it is the verdict that affects one.

I am now convinced that the "toy" outfit has a distinct office for the professional photographer if carefully and intelligently used. By its aid he can accomplish very much more work, and without a tithe of the fatigue. Many days on Dartmoor I would not have risked leaving for a day's work on the moor had work meant carrying a heavy camera, but with a quarter-plate and macintosh, weather mattered little, and over and over again a miserable looking morning would break out at middle day and fine photographic weather prevail. The quarter-plate man was on the spot at such times, whereas the "old-time" professional was miles away, at home, using embroidered phrases in his description of the weather.

My choice of the quarter plate size was quite an accidental one. I happened to have the camera by me. Probably a 5 x 4 would be better, and not much heavier, but the so-called landscape shape i. e. 5 x 3¼, etc., should be carefully avoided as it is quite unsuitable for all-round work.

Another warning I would utter, don't on any account use films, either roll or flat. I tried roll films and quickly saw that when it came to making enlarged negatives from negatives taken on roll-films the amount of dirt, etc., that had been picked up by the films made them quite useless for this kind of work.

My training in landscape photography was a severe one, under men who were "masters" in their craft, and who exacted the very best in everything; hence it will readily be understood that it is difficult for anyone educated in such a school to break away from authority. I am, however, quite convinced that the worship of large size cameras for field work is a mistake on the part of the professional publisher. Much more work, and much better work can be done by a judicious reduction in size and weight. Moreover, I have come to regard working from re-produced negatives as of itself quite a step forward, owing to the opportunities afforded of making improvements in one way and another.

Tempora mutantur, and if the professional photographer is wise he will add, *Et nos mutamur in illis.*



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THE HOPES OF YOUTH. A. F. MUHR.

HINTS ON GUM PRINTING

By A. F. MUHR

IN the pursuit of the ideal one is apt to be led astray by some will-o'-the-wisp and mired in a bog. After getting out one is very likely to follow the same Willie to the same bog—but, if one is wise and profits by previous experience one should not become mired a second time.

I presume that every one who is engaged in some serious work, be it in photography or any other pursuit, has formed an idea, sub-consciously perhaps, of the finished result; in fact, has visualized the ideal. I have often tried to define my ideal —to conjure and project upon the screen of my mind that perfect result which should embrace all the points necessary to complete satisfaction, but I have always failed to form any tangible let alone definite idea of what it should be. It is not anything that I have done, of that I am certain, though the best of which I am capable may be accomplished.

I have seen things by others which were the source of inspiration and spurred me on to renewed and ambitious attempts and earnest efforts. In beginning a new work it may take shape in my mind that my ideal is about to be realized; and, though the achievement may be successful, it has never



HOME PORTRAITURE.

A. F. MUHR.

attained that point where I felt justified in saying, "Behold, my Ideal!" The best I have yet done has met with severe criticism, often with disapproval, as soon as the first flush of victory over technical difficulties has worn off.

Mr. F. C. Tilney, writing of the color work in pigment printing shown at the exhibitions of the London Salon and the Royal Photographic Society, in "Photograms of 1912," says: "The truth is that pigment printing in color must be a *tour de force* every time. If it is not that it is mere trifling. Regarded in the light of experimental work, the color efforts at the exhibitions claim respect and redound to the credit of their authors, who have in varying degrees triumphed over difficulties insuperable enough to be forbidding in the ordinary way of things. Success seems almost within grasp in some examples by O. Heidlberg, R. N. Cocks, Haldane McFall, F. J. Mortimer and C. F. Stuart at the Salon, whilst at the Royal Photographic Society J. Tucker's landscapes achieve a lively realism and that of A. F. Muhr a fair measure of decorative interest. But a miss is as good as a mile in art; one feels that if a thoroughly successful development of oil prints by color pigments is possible, the time for it has not yet arrived."

As I have chosen gum bichromate as my ideal medium of expression for pictorial work I shall not attempt a defense of either the process or its devotees. We know that the only way to solve the problem of *"successful development"* is by earnest and persistent effort until for one of us the *time* will *"arrive."*

For a time I was devoted to brush development on platinum with glycerin restrainer. One has a fair measure of control and for sketchy effects it can hardly be surpassed; also where some undesirable portion of the negative is to be eliminated it has its advantages. For strength, breadth and virility, however, there is nothing that can approach gum-bichromate printing. Oil printing may be in the same category, but so far my attempts have not been so successful as to justify me to abandon the other, though I will admit being fascinated with its possibilities.

In gum printing every step is absolutely in the power of the worker; the choice of paper, the pigment, the composition



SHIPYARD, MIAMI RIVER. GEORGE STEELE SEYMOUR.

of gum and bichromate solutions, so that one can fit any subject and almost any quality negative. I know the universally accepted opinion is that, theoretically at least, the shortest curve is credited to gum work in relation to gradation of tones. Modification of the solutions, however, particularly the gum, will give a wide range of tones and permit any amount of detail and delicacy of rendering to be obtained. In printing one may resort to all the known dodges or which may be suggested by the exigencies of the case, such as vignetting or shading and finally flashing the prints.

Then in developing one may use so many means and methods to fit each particular case. Floating face down in cold water for spontaneous development and, if necessary, raising the temperature. Brushing with soft and hard brushes, a stream of water with more or less force, local development with hot water, sawdust in water poured over print, even sand and water where the printing has been deep enough. There are so many tricks in developing manipulations that it keeps the inventive faculties alert and the results fully justify the means.

The sketchy portraits which I exhibited at the Ninth American Salon, in London, and at St. Petersburg, where they received Honorable Mention, are made by securing a rough outline from the reverse side of the negative and then applying the pigment solution within the lines only and finishing from the neck down with a few sketchy strokes. If the outline is too severe after printing it is well to flash in a background through a mask or cut-out. I have gratified my sense of fitness, and for no other reason, by printing these in Indian red and the finished prints look like drawings in red chalk, the sanguines which are so much in vogue among artists.

In landscape work I generally proceed by first making a light print either black or brown, depending, of course, upon the ultimate effect desired. In the second coating I block in my colors, where needed, for tone qualities rather than any reference to detail. For the third printing I pay some attention to the light portions of the negative—such as high lights on foliage, skies, etc., giving them the advantage of a suitable pigment, which, after first exposing under the negative are printed in from the back of the print through the paper, the

print protecting the other portions. Skies can also be flashed in and by proper manipulation clouds can be worked in that will often materially aid in the pictorial effect.

Much has been said in regard to shrinkage of paper, and nearly all papers will shrink more or less after the thorough wettings necessary in developing. A method which I adopted some time ago minimizes the appearance of double printing to an extent that it is barely noticeable. Unless this condition is too marked it is hardly a detriment, as sharp outlines would hardly be pleasing where the aim should be strong, broad effects.

I place a narrow strip of paper about the middle of one end and nearly half way down on each side of the negative and mark a line with ink to the edge. When I lay the sensitized paper in place I extend these lines with a pencil on the back. No matter how much the shrinkage, by centering the paper in subsequent printings by these lines the pull is equal in all directions toward the center instead of to one corner as in the old method of registration.

It is not a process that can be readily or commercially exploited and in the studio we use platinum paper almost exclusively for the portrait work. It is a busy workshop, this studio of Mr. E. S. Curtis, for besides the portrait work all of the field work is sent here for developing and a great deal of the preliminary work for the "North American Indian" —such as the making of the positives for the photogravures for illustrating that work are made here.

That will perhaps account for the fact that I am not a more prolific producer of gum prints, as I consider it a process for the man of leisure, or at any rate for one who is not apt to be interrupted in his work. Of course we have made some portraits in gum for our patrons at good prices and Mr. Curtis sold some gums, which I made of his Indian subjects, at gratifying prices in the East, but what is more to the point and highly flattering, several of the purchasers are known to the world as discriminating collectors of pictures.

There is an element of accident about the process that is the cause of continual surprise and perhaps accounts, in a way, for the improbability of ever getting two prints exactly alike even were that desired. A little over or under-printing or a



THESE ARE MY JEWELS. HELEN W. COOKE.

hasty movement in development may cause an entire change in the desired situation and yet may give a pleasing result.

To my mind this grateful, though elusive, medium is the ideal for the pictorial worker, as step by step it is stamped with the mark of his individuality and, in viewing the results, there is always present a feeling of greater possibilities, of something beyond, something better yet to be obtained, that ever stimulates to renewed and more ambitious efforts.



A FUTURE MATHEWSON. CHARLES M. CONLON.

A NEW METHOD OF ENLARGING

By A. E. SWOYER

THE photographic profession has always taken it for granted that a certain loss of detail must be expected whenever an enlargement was made, and that such loss fixed the limit or degree of enlargement. This depreciation, if we may so call it, has been blamed upon the inevitable diffusion caused by "spreading" a small image over a large surface and upon the granularity of the emulsion with which the original plate was coated—a granularity which has of late become the more noticeable from the increasing use of ultra-speed plates.

Without making any claim to great scientific knowledge, the writer has from time to time conducted various experiments along this line, and—perhaps by rushing in where angels fear to tread—arrived at a method by means of which this falling off, while not entirely avoided, is reduced to a negligible quantity. Since this method differs radically from any with which the writer is acquainted, in accordance with the modern tendency he is going to name it after himself and offer it to the fraternity for what it may be worth!

In brief, the method consists in eliminating the negative—which appears to be the chief source of trouble—entirely from the actual process of enlarging, and in so doing dispose of numerous other annoyances and expenses connected with the old style process. To accomplish this it is only necessary to make a contact print, preferably on glossy paper, from the negative and use this print in the subsequent processes—the essential step of which is in projecting the image of this print, by means of apparatus differing from the common post-card projector only in its lens equipment, upon a dry plate and thus produce an enlarged negative from which subsequent large-sized prints may be made.

By this means, and using a special apparatus patented by himself, the writer has secured enlargements of sixty-nine



PASTURE FLOWERS IN THE BERKSHIRES. Rudolf Eickemeyer.

times the surface of the original negative with no appreciable loss. It is his opinion that this scope might have been increased very largely and that equivalent results might be secured by any practitioner, using a common post-card projector with a camera lens substituted for the regular optical equipment of that instrument.

It may be brought out that the making of an enlarged glass negative instead of the direct enlargement upon paper involves additional expense, but this is indeed of slight importance as compared with the manifold advantages of the process. First, of course, is the retention of detail, which seems to be due to the fact that there is no transmission of the light-rays through glass, but there are other phases almost as important.

Consider, for example, that in the apparatus for such work neither condensers, nor the arc light with its attendant rheostat are necessary; with two sixteen candle power carbon filament lamps (the ordinary incandescent bulbs of commerce) the writer secured the before-mentioned enlargements with an exposure of thirty seconds, lens stopped to F/32—the stopping-down being done to produce an exposure long enough to control, rather than to secure additional detail. Then, too, in cases where it is desired to produce enlarged negatives for use with other processes it may be accomplished by this method without the use of a glass positive, thus cutting one step from the older method.

More than that, since a simple contact print is substituted for the original negative throughout the work, all danger of damage to the latter is avoided, while, by very simple manipulations made easy because the work is done upon a paper base instead of one of glass—and because the image is a positive one where exact effects may be noted, and because it is feasible to work by direct light rather than by transmitted—almost any amount of control may be exercised. Thus, tonal values and contrasts are modified by the use of transparent colors applied to the print, a wash of the less-actinic shades serving to accentuate clouds, etc. If it is desired to make a combination enlargement from two or more negatives, think how much easier it would be to make the small positive by double printing upon some brand of printing-out paper, where each step may be seen, instead of relying upon a multiplicity of masks

and other impedimenta in ordinary enlarging. If you have ever tried to secure exact register of such masks upon an enlargement where none of the image may be seen until the final effect flashes up in the developing bath, you'll appreciate this point!

Whatever you may be led to think of "Swoyer's Method" (!) of enlarging, it will not cost you much to try it out. Should you do this, the writer feels confident that you will find possibilities therein not offered by the processes now in vogue.



CHESTNUTS. NATHAN R. GRAVES

BROMIDE PRINTS IN THREE COLORS

By A. L. HITCHIN

FIRST of all, it is necessary to have the bromide print "just right". By that is meant a print that is correctly exposed and developed as far as it will go. Under-exposed prints may occasionally be used if not too much so; over-exposed ones are quite useless.

The following articles and solutions will now be required before commencing toning operations:—three or four brushes (preferably sable) Nos. 3 to 5, a small quantity of almost any kind of turpentine varnish, some benzine, or motor spirit, and a piece of "Plasticine" or modelling clay.

FERRICYANIDE BLEACHER

Potassium Ferricyanide	½ oz.
Potassium Bromide	½ oz.
Water	20 oz.

SULPHIDE SOLUTION

Sodium Sulphide	1 drachm
Water	10 oz.

GOLD TONING SOLUTION

Gold Chloride	1 grain
Thiocarbamide	6 grains
Sulphuric Acid (1 in 40)	½ oz.
Water	4 oz.

Various shades of brown or sepia for special effects may be obtained by the substitution of potassium iodide, or common salt, for the potassium bromide of the bleaching solution.

After deciding which parts of the print are to be brown, or flesh color, we now proceed on the dry print to paint over those parts with the bleaching solution. Care must be taken not to allow the solution to act beyond the required area.

Should an accident happen the part may be redeveloped to its original blackness by blotting the part surface dry, and applying an ordinary amidol developer by means of a clean brush.

When the silver of the image is completely bleached the surface moisture is now blotted off carefully by using the edge of a piece of blotting paper. It is not advisable to use the blotting paper as one ordinarily does, as this is likely to force the bleacher beyond the prescribed area.

The print is now placed *face downwards* in a dish of water, *so allowing the bleacher to sink.* This is important, for the gradual dissolving out of the solution would partially bleach the surrounding portions of the print, were it placed face upwards. The water must now be changed frequently until it is free from yellowness.

It is now placed in the sulphide solution until chemical action is complete. Four or five changes of water should now be given and the print allowed to dry. The print has now a not unpleasing appearance, but a much more lifelike result is obtained after the next stage in the process is complete.

The parts that we wish to remain sepia are now painted out with the varnish. It is not necessary to paint out the black portions as these remain unaltered in the final stage.

We now take a piece of "Plasticine", or modelling clay, and roll it out to about the thickness of a lead pencil, sufficiently long to surround the portion to be toned. This is placed in a circle and pressed down on the print to form a watertight joint.

The gold toning solution is now poured into this confined area and allowed to act until just before the desired colour is reached. It is then poured off the print and the print placed in water.

Our reason for the use of the wall of "Plasticine" is to allow as little of the solution to be used as possible; otherwise a difficulty may be experienced in staying the action at the right moment, owing to the continuing action of the solution absorbed by the paper and gelatine.

Half a dozen changes of water are now given and the print pinned up to dry. When quite dry the varnish is easily removed by the application of motor spirits on a pledget of cotton wool.



A. L. HITCHIN.

UNUSUAL LIGHTINGS

By L. M. A. ROY

THE unusual lighting about which I am writing, is one in which the main source of light comes from behind and above the subject. Although many photographers do not attempt such a method of lighting, it has innumerable possibilities, no end of variety, and many very beautiful pictures have been made by its use. This lighting is adapted to decorative pictures, the nude especially; and those who have never taken nude photographs should try this lighting at the first opportunity. I will explain the procedure as briefly as possible.

The Camera.—Any camera can be used, but one which has a ground glass for focusing is to be preferred, as the composition and lighting can more easily be adjusted when looking through this screen. A tripod is necessary, as the exposures are long and the camera must not be moved.

The Lens.—Any lens may be used, but I have found, a soft-focus lens, such as the Smith Semi-Achromatic, most satisfactory, as the diffusion given by this lens, greatly adds to the decorative effect, especially when taking nude figures. Another advantage of using such a lens is that no retouching is necessary.

Lens Hood.—The main source of light coming as it does from above and behind the subject, it is necessary to put a paper hood on the lens to keep the direct rays of light from hitting it and causing halation. This hood can easily be made by wrapping a piece of black or dark paper, or card-board, around the lens and tying it with twine. The hood can be pushed forward or backward, until the direct rays of light from the window do not strike the lens. Care should be taken that the hood is not pushed forward enough to interfere with the image on the ground glass.

Pose.—The subject should be posed in some simple manner and a pose that can be held for some seconds. (Ten to



THE STONE AGE.

Illustrating Article "Unusual Lightings," by L. M. A. Roy.

Twenty-Five or Thirty according to the light.) I have found that it is best to keep the composition as simple and strong as possible.

Lighting.—The main source of light for the pictures I have taken, has been a window about three feet square, and about seven feet from the floor. Of course if such a window is not to be had, one can be made by covering the bottom half of an ordinary window. If the light does not fall strong enough on the subject, a white sheet can be pinned above the window to reflect light downward. Should there not be enough light on the shadow side of the subject, another sheet can be hung or pinned to reflect light where it is needed. After some experimenting it will be easy to judge the quantity of light needed.

Exposure.—Be sure and give plenty of time. I generally give from Ten to Twenty-Five or Thirty Seconds according to the light. Of course the subject, pose, background, and effect desired will have a great deal to do with the exposure. A few trials will give the photographer a good idea as to the correct time for different subjects.

Plates.—I have found that most ordinary plates will give good results, but Isochromatic or Orthochromatic Non-Halation will be found best.

Development.—Any ordinary developer may be used, but I have found a weak solution of Rodinal best. The plates should not be developed too long as rather thin negatives will give the best results.

Printing.—I have found Platinum best suited for such lightings and subjects, but if a developing paper is used, the rougher and softer grades will give better effects from these negatives. This method of lighting is very simple and interesting and a few experiments will more than repay the photographer for his trouble.



AT THE LOOM.

Illustrating Article "Unusual Lightings," by L. M. A. Roy.



YOUNG JELLY FISH SLIGHTLY ENLARGED.
Illustrating Article "Microscope and Camera," by Walter Bagshaw, F.R.M.S.

MICROSCOPE AND CAMERA

By WALTER BAGSHAW, F.R.M.S.

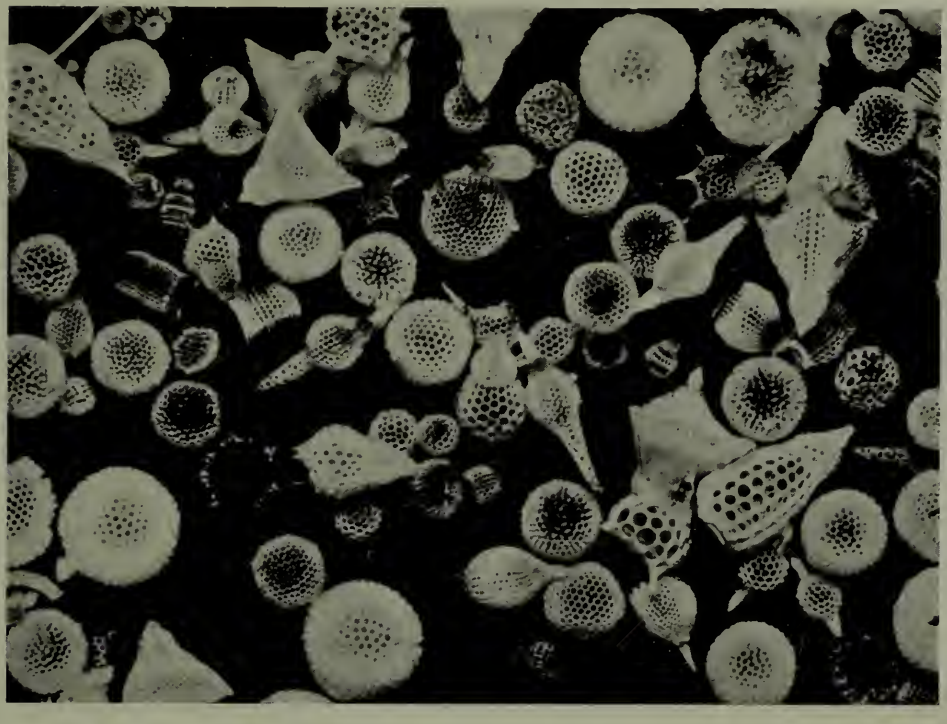
IN the illustration of books there is no doubt that photography takes first place, as apart from commercial considerations of cost and facility of reproduction it places in the hands of the present day artist a power of expression not easily obtained by the cruder methods of a past generation.

The telescope and spectroscope used in connection with the camera have been made to yield most important facts, but probably no branch of the photographic art has received more extended application, nor given more valuable results, than that of photo-micrography, which enables the microscopist to secure a wealth of detail from the minute forms of life quite impossible by any system of sketching through a camera lucida.

It should not be forgotten that both camera and camera lucida may be a fruitful source of error, either through absence of knowledge necessary to avoid it, or the bias of what is called the personal equation. For pictorial purposes this individu-

ality is of the highest importance, and latitude is rightly given in the treatment of both negative and print, but to the scientific worker whose aim should be to depict nature simply as it is such doctoring of a negative is strictly forbidden. Mere prettiness is of no value unless it conveys a truthful rendering of the object photographed, and this dominating element of accuracy should be borne in mind by all photo-micrographers.

Now, it is a strange fact that there are many medical students and amateurs in every grade of society who take up pho-



ENLARGED POLYCYSTINA.
Illustrating Article "Microscope and Camera," by Walter Bagshaw, F.R.M.S.

tography as a hobby, while at the same time regularly using the microscope for serious work who nevertheless have never tried the camera and microscope in combination.

This may arise from lack of thought, though probably a total misconception of fancied difficulties has had a deterring effect. Whether from one or both causes the purpose of the present article is to call attention to the fascinating simplicity of photographing through the microscope. Independent of weather, scenery, and sunshine, the photographer may be seated at a comfortable fireside by gaslight and produce pictures mar-

velous and instructive; records of a vast kingdom invisible to the unassisted eye. A simple experiment will enable the owner of any microscope to use it as a magic lantern for projecting a magnified picture of his slide on to a piece of white cardboard, and the only difference betwixt enlargements made in this manner and pictures in photo-micrography is that for photographic purposes the magnified image is received on the ground glass screen of the camera, subsequently of course on the sensitive plate, instead of on a cardboard sheet. Place the microscope in its horizontal position, first having swung the mirror on one side and removed the substage condenser. Put in the lowest eyepiece and a two-inch objective and focus on a slide of say a botanical section. Then lower the room lights and bring round the lamp and bull's eye and adjust them so that a set of horizontal rays is projected through the slide to be examined into the tube of microscope. If the cardboard be now brought near to and opposite the eyepiece the object will become at once visible.

Now remove the lens from a camera and without disturbing the position of microscope insert its end in the opening thus made so that the image may be received on the focusing screen, and you have the elements of photo-micrography. Focusing, illumination, exposure, &c., are matters easily learnt when once the modus operandi has been grasped. Any book on the subject will give details more fully than is possible in this article.

Think of the advantages to be derived from a photograph when any disputed point arises, as it often does, in the structure of an organism. One observer says he sees a certain formation, while another sees something quite different. The point of focus, nay, even the illumination, may make all the difference, and without tangible evidence in support of one's contention a verbal dispute may continue indefinitely. Here a picture of the matter in question at once puts the disputants on common ground, tells if they are taking the same standpoint, and enables them to join issue in a rational way or agree on the cause of divergent opinions. Then the saving of time to one needing illustrations is immense. Fancy the labor undertaken by some conchologists in sketching the thousands of teeth in the tongue of a snail. Half an hour with



AGAINST THE LIGHT. EDGAR A. COHEN.

microscope and camera will secure better results than a month's labor without the aid of camera. The same may be said of geological and botanical specimens and numerous other objects which are often required by teachers and students.

The negatives too can be used not only for prints but for lantern slides, a powerful aid in school work.

A lecturer who relies on mere diagrams is at a distinct disadvantage compared with one who puts a fine photographic illustration on the screen.



Figure 1.

The business man as well as the professional man will find endless ways of turning microscope and camera to profitable account as the range of subjects is unlimited.

To one in search of a hobby probably no better objects could be taken than diatoms (Figure I) a group of unicellular plants to be found wherever there is salt or fresh water or damp earth, and for photographic purposes no better objects can be desired. In size they are so tiny as to be almost invisible, yet marked with exquisite patterns of delicate and intricate lacework that attract both novice and specialist alike and make



MONDAY.

W. H. PORTERFIELD.

them the playthings of a microscopist. Evidently therefore Nature does not lavish its gifts of beauty through processes of evolution for nothing prettier can be found in highly organized structures than in these simple cells of the vegetable kingdom.

When viewed in a living state a drop of water may show diatoms moving about in numbers and kept free from collision by some mysterious agency not yet known. It is not the living plant, however, so much as its siliceous skeleton in a prepared state that makes it dear to the microscopist, for undoubtedly it was the attempt to make visible all the minute markings of the diatoms that brought about such a great improvement in microscopic objectives.

For educational purposes the use of camera and microscope promises great future development, especially in recording the movements and growth of disease germs as shown by aid of the cinematograph. In this direction alone there is ample scope for original work.



AFTER THE STORM. K. T. KRANTZ.

LABORATORY NOTES

By M. G. LOVELACE

THERE are so many things that seem to me to be of pressing interest to the photographic world in general that are so seldom touched upon in any article, it is hard to select one thing that is of more importance than another. In the course of the year's experimental work—and I may say that my work is largely in this direction—I have encountered so many inquiries from amateurs and professionals alike that it seems to me about the best thing I can do is to answer some of the questions in this article that I have answered individual inquirers.

In the first place I would like to say a few words about apparatus. When one begins a course of experiments in chemistry for any purpose whatsoever, the first thing to be done is to see that the apparatus used is adapted to the purpose and next—and most important—that it is *CLEAN*. Not rinsed with water or wiped out with a rag, but absolutely clean—containing no foreign substance whatever. Many will tell of hypo trays that cannot be used for anything else but hypo, as one is never sure that the salt is completely removed. If you will just take a little nitric acid and put it in the tray, dilute it with a little water, empty, and then repeat this process once or twice, it will remove all the hypo. Why? When hypo comes in contact with an oxidising agent it is converted into sodium sulphate which is very soluble in water and which is absolutely harmless to your developer if a trace is left in a corner. Give your hypo tray a bath with it once in a while and always have a clean tray.

After cleanliness comes convenience. In scientific work of any kind one soon finds that the metric system of weights and measures must be used as time will not allow the constant figuring of the English weights and measures, and the liability of error is too great. If you are going to make a ten per cent solution with the ordinary weights, you take an ounce of the

chemical required and dissolve it in water and make up to nine ounces and something, I really forget what. With metric weights if one wishes to make up 265 centimeters of solution, 26.5 grams of the chemical is weighed up and dissolved in water, which is then made up to 265 centimeters and the trick is done. If a certain quantity of developer is too small there is no calculation to be made of grains to drachms, and drachms to ounces, but the necessary calculations can be done mentally as quick as they can be written down.

Get a set of weights at one of the establishments which supply laboratory materials,—they can be bought cheaply, a set from .01 gm to 20 grams costing about a dollar, and at the same time get a couple of graduates, a ten centimeter and a hundred centimeter. With these and a copy of the ANNUAL you can make up all solutions, make them more accurately, and more rapidly than with the ordinary weights and measures. A small balance can be had cheaply. The better balance you buy the better you will be satisfied with it, and I venture to say that your satisfaction will be reflected in your work. Keep your balance clean and test it before you use it, putting equal weights on the pans and trying the needle, as it is found in a research laboratory that a balance has to be adjusted after every weight. Then buy a thermometer. Please do not buy one of the drugstore kind, as a good one will only cost a few cents more, and you will find that you will respect its cost enough that you will take better care of it than of the cheap one, and by consequence it will last you longer. These by the way are sold as chemical thermometers, and you will do well to get one reading to 100 deg. centigrade as that is the boiling point in this system. I have known trouble with tank development which was entirely the fault of the handy little thermometer which you could hang on the side of the tank and it would lie to you about the warmth of your solution.

Next a good clock—there are half a dozen on the market, all good, with possibly the Watkins a little in the lead, and if your purse is long enough, one of the ingenious little contrivances known as an interval timer, which will pay for itself in the first batch of plates you would have forgotten, in the tank. Then chemicals—oh, dear, how that word is abused. The awful stuff that is sold as being suitable for photographic pur-



MOTHER AND CHILD. GILL & SON.

poses which really is not fit for anything. Sulphite which contains about ten per cent sulphate, carbonate which contains eighty-six per cent sodium carbonate, and the balance miscellaneous sodium salts, dirt and not infrequently sodium hydrate. These two chemicals can be bought cheaply of any of the chemical supply houses, though any dealer will supply a C. P. chemical if asked.

If one gets an impure carbonate it can be tested easily enough, although the work probably requires more knowledge of chemistry than the amateur is fortunate enough to be blessed with. Sulphite also may be easily tested, but if one is careful to see that their chemicals are made by first rate firms and are marked C. P., and have an analysis on the bottle, they can be reasonably sure that there will be no trouble with this part of the work. I can recommend the Mallinckrodt chemicals obtainable through any stock house, and the excellent chemicals of Baker & Adamson. Others make C. P. goods of the same quality, but these two I have found most satisfactory in my work, and feel that I can recommend them from my own experience. Metol, hydroquinone and pyro do not differ very much, as I believe that they are made by a few firms only although sold under many brands. One chemical I can vouch for as being the most useful of all the developers, and that is rodinal. It will do anything that any other developer will, if used properly, does not stain the fingers, works well in any dilution, and makes splendid prints on any paper.

While I am speaking of rodinal, I want to say a word on its application to color photography. A solution of one part rodinal and nine parts water will develop a color plate for first or second development with perfect success. I have been using this method for the purpose for the last year, and am perfectly satisfied to leave the mixtures of metol, hydroquinone and ammonia as well as pyro-ammonia to those who like the smell of ammonia in their laboratory.

One new thing I have found with regard to color plates that may be of value to others, and that is a method of developing these plates (Dufay-Autochrome, and the others) with an ordinary light, ruby of course being taken for granted. Make up a solution as follows—



PORTRAIT. Helmar Lerski.

Water	100 cc.
10% Potassium Bromide	10 cc.
Saturated solution of Sodium bisulphate	2 cc.

Bathe your plates, after exposure, in this solution for two minutes. Rinse well in the dark, and you may develop in a ruby light as the color sensitiveness is destroyed by this solution. Gradation is not affected and if you are not satisfied with working with time and temperature methods, you can obtain excellent results in this way.

In speaking of what I consider the most important items in a photographic laboratory, I forgot several things—a Watkins meter, and a copy of the "Principles and Practise of Photography," by Alfred Watkins. These two items with a Watkins time thermometer should have been mentioned first.

In connection with color plates one point must not be forgotten. If you are photographing dark objects with a color plate do not forget that your exposure must be increased in the same ratio as with an ordinary plate, 50 per cent more being about right as a general rule. The subject of color photography leads me to the use of the panchromatic plate. I really believe that if every reader of this article, who does not or has not used the excellent Wratten & Wainwright Panchromatic plates, could try a dozen using the excellent filters which are supplied by the manufacturers they would never buy anything else. They are as near non-halation as the average double coated ortho and the quality of the image is a thing that one never tires of. There is about the difference between the panchromat and the ortho that there is between the ortho and the wet collodion. Try them and be happy with a plate that will do anything you wish, do it perfectly, and never fail you under any trying conditions.

It is possible that the reader of this article may say to himself, "High-priced chemicals, high-priced plates, high-priced lenses—not for me." I can assure this same reader that if he will try the scientific way of making negatives, i.e., the clean, exact, methodical, sure way of making pictures, using a meter, panchromat plates, the excellent filters supplied by Eastman and develop with a tank or factorially, using a thermometer, and trying everything every step of the way, he will not only get better negatives, but he will also get more of them—nay

they will almost all be good, and he will find at the end of a year that he has spent less money, had more enjoyment, and secured a class of pictures that he never could have hoped to attain with the snapshot-Jones-does-the-developing-and-printing methods.

I have one man clearly before me, a man who a couple of years ago was a kodakist pure and simple. Produced good work, but could not get what he wanted. Today that same man is using panchromat plates with the Eastman filter, using a meter, using a tank, and watching every step, and prints from his work two years ago and today would tell their own story. He was very fond of nature photography, but could not get what he wanted, until he used a plate that could see all the colors. Bright-colored flowers, birds, butterflies, and plants are not exactly a success with a plate that is half blind. It is not necessary to get a very expensive set of filters as the small sheet gelatine filters only cost $1.00 per set of three (a 1½, 3 and 4½ times, the K1, K2 and K3), from any kodak dealer. They must be handled with a bit of paper or the finger will leave a mark on them, otherwise they are entirely satisfactory. Cut them the proper size to drop in place in front of your iris diaphragm, screw the front lens cell in place and there you are.

If you have a Dufay plate that is not satisfactory, it can be used as the basis of an interesting experiment. Clean the old emulsion carefully from the screen, being careful not to scratch it in so doing, dry it and put to one side. Some fine day take this screen and a panchromatic plate of the same size. Put the panchromat in the holder, and put the screen in on top with the screen next to the film of the plate. Reverse the ground glass of your camera, put on a Dufay filter in front of your lens and give about the same exposure as an ordinary Dufay plate. Develop the panchromat plate, cutting down the tank time a little or using a smaller development factor, fix, wash and dry your plate. Now make a lantern slide from this, making a rather soft slide—not the ordinary snappy soot and whitewash slide. When it is dry, sit down in a comfortable chair, and placing the screen used for taking over the positive, register the colors. The first thing to do is to get the plate free from the appearance of color. By rotating the plate



"O'ER THE WESTERN SEA." JAMES N. DOOLITTLE.

very slightly, this is easily secured. Then begin by moving the plate very slightly in one direction and then another until an appearance of color of one sort or another appears in the plate. Generally when this result is secured a slight pinching of the two glasses will cause sufficient slip to cause the colors to appear. This sounds a great deal more difficult than it really is, and I can assure anyone who tries it that they will find little difficulty in producing an excellent color plate in this way. I do not believe there is any infringement of the Dufay patent in using a waste screen in this way, as the plates were at first made to be used with a separate plate. Personally, I have secured better results on the Dufay than on any of the other color plates, both in transparency, and in the fact of their standing the heat of a projection lantern better than the others.

The colors I believe to be as true as those in the other plates, and they are simplicity itself to use. It is possible that some of the readers of the ANNUAL may care to experiment in the making of filters for the Dufay plate, for use with arc light, etc., using some of the various formulae for the dyes and then mixing them with gelatine and flowing on a glass plate. If there are such, I am glad to be able to give a formula of my own for the making of the solutions.

Chloroform	20 cc.
Ether	100 cc.
Ethyl Alcohol	84 cc.
Dye Sol (Amount of dye required in 30 cc. distilled water.)	30 cc.
Hydrogen peroxide	30 cc.
Gelatine	4 grams

Of course this may be made up in any quantity using the above proportions, and you will find that it will dry in about ten minutes, clear, and hard. Keep away from fire while it is drying, also keep your stock solution from the heat. This mixture of gelatine, dye, and the alcohols and ethers, will dry much quicker than an aqueous solution of gelatine, will dry clear, and does not frill in drying.

Another point—another formula—that may prove very helpful. Many of us have used glossy paper that had abrasion



S. H. LIFSHEY.

marks on it, in spite of non-abrasion developers, iodide of potassium and much care. There are non-abrasion sodas on the market, but they are a trade secret. The trade secret does not exist long in a chemical laboratory, and the following formula will be found to do all that any non-abrasion soda

Sodium Sulphite.....	1 oz.	29 grams
Sodium Carbonate.....	370 grains	24 grams
C. P. Hypo.....	8 grains	½ gram

A mixture in these proportions may be used in place of soda for paper or

Sodium Carbonate	28.75 grams
C. P. Hypo.....	28.75 grams
Water to	500.00 cc.

Use 10 cc. to every litre of developer.

There has been for some time in Europe, a method of sensitizing autochromes, in order to get more speed, and I have no doubt that the Dufay or Omnicoloure would stand the same treatment. The plates are bathed in the following solution in complete darkness.

Distilled water	66 cc.
Ethy Alcohol pure—90 deg	33 cc.
Dye solution	2 cc.
Ammonia	.30 cc.

The dye solution mentioned is a mixture of pinachrome, pina verdol and pinacyanol, 1 part of each in 1000 of alcohol. Plates should be bathed for five minutes. Bathe four 9 x 12 cm. plates or quarter plate size plates in this amount of solution, in succession, in absolute darkness, and dry carefully away from dust. These plates require a different filter than the ordinary color plate, the formula being given below.

Hard Gelatine	3 gms.
Distilled water	100 cc.
Filter yellow, K 1% solution	2.5 cc.

Use one cc. of this solution to each ten square centimeters of surface. These plates will have about five times the speed of the ordinary color plate, and it is quite possible to make snapshots if a lens working at F/4.5 or F/5.6 is used. These dye solutions are supplied by the Lumiere company and it is worth while buying them to save the trouble of making up a solution unless you are a bit of a chemist.

Once in a while the best of cameras will get a bit off, and a trace of light will creep in and leave its indelible trace of blue on the particular color plate that you were most anxious to have a success,—it was such a pretty spot and the light was right, and the girl was better than the scenery or the light, and then a stray point of light crept in through a corner of the bellows and there you are, you know. We've all seen these things, and said what we thought of them when we were alone. Try this. Get a tube of Soloid Stain—the yellow shade, fix out a dry plate the same size as your color plate, wash it and then dye it. Don't be in a hurry. Soak it for a minute in the dye and then take it out and look at the color plate through it. The yellow stain will cut out sufficient of the blue light striking



WINTER GARB.

J. R. PETERSON.

the plate that it will restore the transparency to normal color values. If the first trial seems to leave the plate still too blue, soak your gelatine plate again and get a deeper yellow. You can make a screen that can be used as a cover glass for the picture with very little trouble and get a more perfect rendition of color than you would suppose possible. These soloid stains are splendid things to dye up lantern slides with. I have found them better than half the chemical toners I have ever tried. An outfit of tabloid chemicals is also about as handy a thing to have as one can imagine. Any kind of developer, fixer, toner, reducer, intensifier, or in fact any ordinary photographic solution, can be made up with perfect accuracy in a moment with C. P. chemicals and without trouble. While I am speaking of ordinary solutions, it occurs to me that these two may be of interest to those who may like to try new things.

An exposed plate can be bathed in a four per cent solution of potassium iodide, in the dark, for about five minutes, and may then be put into a tray of developer (after rinsing) and developed in daylight. The developer should be Metol-hydroquinone and sodium or potassium hydrate and containing considerable bromide. Another curiosity that I have found is the following method of developing plates in daylight, with development and fixing simultaneous.

Make a powder as follows—

Magnesium picrate	81 gms
Sodium Sulphite (Dry).....	544 gms
Hypo C. P.....	250 gms
Dianol	125 gms

4 grams of this mixture in 100 cc. of water is used and when the plate is once placed in this, it may be brought out into the light and development and fixing are completed at the same time. Of course this method is only applicable to the old fashioned or stone blind plate—the non-ortho plate, the plate that resembles the old man's horse of which he said—"He'll go as far and as fast as any of them if you only give him time enough and don't try to drive him where he can't go."

In connection with color plates I would like to mention another point that is not generally known. Stereographic views



MEMORIES. A. McFarlin.

can be taken directly on the color plate and looked at without cutting the plate or using two small plates in the holder. Get one of the little contrivances, sold in England under the name (please take a breath) of the "Stereophoto-duplicon." Burke & James make the same thing and call it a Stereographic Attachment, which is much easier on one's vocal organs. It is an arrangement of mirrors similar to Claudet's Teleostereoscope, that can be slipped on the front of the lens mount and with one exposure, one plate, without cutting the plate or the print will give you excellent stereographs. The separation of the images, and the width of the dark area between the prints can be adjusted while watching the ground glass, so that all one has to do is to take the stereo negative with this attachment, make a print from it and mount it on a card and the results are equal to any stereograph, except that as a matter of course the visual angle of your lens-image is cut in halves, so that a lens giving an angle of 46 degrees on a 4 x 5 plate will give an angle of 23 degrees on each of the stereo prints that it produces. But the means is so simple and the results are so excellent, that I have taken a great deal of pleasure in the stereographs, made from it. Now if with one of these attachments and an autochrome or Dufay plate is used, say 4 x 5, the resulting positive will be a perfect stereograph, if looked at with the glass side of the color plate next to the eye of the spectator.

It is often stated that the color plates are not satisfactory as stereographs, but personally I have never had any fault to find with the results, as the grain is not sufficiently enlarged to be obnoxious and the pictures themselves are very much better than the single views.

Washing is a thing that the color photographer has very little to do with, as a brief rinse seems to be all that is necessary, but if the ordinary panchromatic plate is used as in the Paget plate, the washing must be of the same sort as with ordinary dry plates. Of the various hypo eliminators known, there are two that appeal especially to the chemist from the certainty of the reactions involved and the fact that the chemicals needed are simple, harmless bodies, that cannot harm the image. These are potassium persulphate, and hydrogen peroxide. The persulphate is a fairly cheap chemical, more so

than the other, but it has the disadvantage that it is not very soluble. It is generally noted as "soluble with difficulty" in water. It is sold under the name of anthion (anti-thiosulphate) in Europe, and is really a very useful chemical for this purpose. The easiest way to use it is to make a saturated solution, at the time of use, by putting fifteen or twenty grams in a two hundred centimeter graduate, and allowing it to dissolve while your plates are fixing. After the plates are taken out of the hypo, they may be placed in the solution of persulphate, and left for about five minutes. They are then rinsed again and placed in a fresh portion of solution, and at the end of five minutes' soaking, given a wash for five minutes in water. This will eliminate all the hypo without a chance of damaging the negative.

With regard to hydrogen peroxide, I feel that after the various solutions I have seen sold, under this name, that I can only content myself with saying that I know of one make of this substance that is satisfactory—that is the "Hydrogen Dioxide, manufactured by Marchand." This I have used and can vouch for. Other firms may make a solution of the same strength, but I have not seen them, and the Marchand Dioxide is certainly worth the money. Plates soaked in one part water and one of this solution, will have all the hypo oxidised in a few minutes, and it will be easily rinsed out. Do not be stingy with it. An ounce of the solution only contains so much nascent oxygen, and if this is insufficient to oxidise all the hypo left in the plate, you will inevitably get stains. Personally I rather favor the use of a hypo eliminator as the plate washers are all made upside down, and most of them require much longer to wash plates than is really necessary. Hypo solution follows the rule of all solutions of chemicals in water and to the man who really studies these things, that certainly means that hypo in water—i.e., a hypo solution in water—will sink to the bottom, and the average washer that allows a stream of water to run down a tube to the bottom of the washer and then find its way out at the top in the course of time is one of the most unmechanical devices in the world. A plain tank with a tap at the bottom, that can be so adjusted that a constant level of water is obtained, with a stream of water entering at the top, is more nearly what is wanted, but a washer

which would fill in two minutes—allow the plates to soak for five minutes—empty in two minutes, and then begin at the first of the cycle again is what we need, and leaving out of the case a very fine siphon washer made in England which is (unfortunately) not obtainable in this country, I know of no washer on the market which could really be called efficient.

Most of us have had the experience of a plate coming out of the wash water, and trying to get a print while the plate was wet. The usual thing, of course, is trying a piece of thin celluloid—of bringing a piece of D. O. P. and the wet negative together under water and tearing your film while squeegeeing them together. Or one can use alcohol—grain alcohol—with fair results, although I have seen plates frill beyond recall with it, while if one uses methyl alcohol, there is sure to be a stain. Lumières have published a formula which may be new to some of the readers of this, that will enable one to dry a plate in a few minutes. I refer to the potassium carbonate method. In practise, it amounts to this—the plate is taken from the wash water, placed in the solution for five minutes, taken out and wiped dry. The film will not tear or pull, and will stand rubbing with a clean dry cloth. Take a pound bottle of C. P. potassium carbonate, pour in distilled water until the bottle is full, let it stand for an hour or so, and then pour off the solution. By making the solution in this way, one is always sure of having it saturated. Take the plate out of the wash water, place it in the potassium carbonate solution, soak it for five minutes, and then with a piece of clean dry cloth or lintless blotter, take up the surface water. The surface will then have a sort of a greasy look, but a little careful rubbing with a cloth will remove this, and if your paper is perfectly dry, you can pull prints to your heart's content, taking care that the springs of the printing frame or the tension of your printer is not too strong. You will be surprised at the results as it does not seem possible that the process will "work," but in practise it is very satisfactory. If the plates seem to have a little scum on them after a day or so, they may be washed, and dried as usual with no ill effects. Old plates do not seem to work as well as new ones, but a plate that has reached the sere and yellow age is not worth saving, especially as the ortho and panchro varieties will give peculiar

mottled negatives, looking as though there had been small round spots on the film that would not develop. This is often caused by dampness, as well as age, and seems to affect the ortho and panchro varieties more than it does the ordinary plate. I had a batch a short time ago that seemed to have round patches, about four or five millimeters in diameter, in the film, where the image would not develop, leaving dark spots on the print. After a little investigation it was found that the plates (which were double-coated ortho) were a little stale from damp, heat and age. Subsequent experiences have proven the correctness of this, so if you get anything in the way of a negative that seems to have undevelopable spots on it, get fresh plates. The panchromatic plate—that is, the Wratten & Wainwright plate—will stand more of this sort of thing than the ordinary plate, thus making another point in favour of its use.

The title of this paper expresses just what it is—notes—but they are things ignorance of which has caused wrath, expense, and loss of time in my own work, and from the statements of the amateurs who have brought me their troubles, to others as well. Personally I incline to favour the advanced amateur more than I do the professional. The latter generally gets into a rut, and stays there. He does not know anything of chemistry as a rule, and yet he undertakes the most complicated chemical reactions—toning for instance—without a qualm, in blissful ignorance and falls through it with more or less success, while with regard to optics—or light values—or orthochromatics—or anything scientific whatever, he generally displays the most utter ignorance, and I have heard many statements made before camera clubs, and societies, with regard to optical and chemical problems, that any college freshman would be able to attack, and defend his statements. Statements made in all seriousness, with regard to lenses, that any high school pupil would know were false—statements made about chemicals that were simply a joke, and points made in talks on art and composition, that explain why the artist generally says a photograph is not art. I do not blame the artist a great deal although I do not altogether agree with him. But—right here—most of the work that is accepted by the artists themselves—is work done by the advanced ama-



SUNLIT COTTAGE. Harold Cazneaux.

teur, the man who is a good photographer and who is not too stubborn, lazy or stupid to learn new things. Lightings are made in the same old way—plates are of the same old quality, prints and methods are the same, and the demonstrator has all his work of showing the dark-room man or the printer, all that he does with the idea of getting better prints—he sees this all go to waste, and the operator go back to his old way, the next day. The whole trouble with all of us, from the snapshot man to the man who has a whole case full of medals, is just this in two words—we do not *know* our business and we are to lazy to *learn* it. It's easy enough to get a crowd of enthusiasts to go out and take pictures and it's not hard to get them to watch somebody else demonstrate new processes to them, but try to get five out of a hundred to sit down and learn why his plate is sensitive to light, what kinds of light it is sensitive to, and why the image develops, or to study a little elementary chemistry, and you'll find a new story to listen to. The amateur will tell you—"Oh, I do not expect to make a business of it, I don't need all that stuff." If the professional answers you at all he will likely say, "Oh, I don't need any of that stuff, I can feel when these things are right and when they are wrong,—inspiration—artistic temperament or something of that sort." I had a man tell me the other day that he had been taking pictures for twenty years and never had felt any need for a meter, that he could smell or hear when exposure was right, or something of that sort. And then with obvious pride he showed me a batch of negatives made at various times. Well, I will not permit myself to express my feelings, but will only say this—that if I had a man working for me six months, and with the use of a meter he did not produce better negatives than any I saw, I would discharge him as being too stupid for my business. Negatives that would print in a second on a machine, and some that actually took ten seconds in diffused daylight with Velox. And this man said he was a photographer—looking at his negatives he was an amateur—listening to his remarks on chemistry and optics, he was a stupid mass of conceit. He succeeds in his business because most of the others are no better. Let's wake up—all of us—books are cheap and it's just as easy to read a book that will put dollars in your pockets

and prizes on your walls as it is to read the ball score or the last dollar-and-eight-center. Oh, I wish I could just take space and say what I think, say the things that I would say to the great mass of those who practise the most beautiful of all arts, and the most fascinating of all the art-sciences. Photography is descended from optics and chemistry, the first going back to the earliest days, for even the Greeks had theories of light and chemistry—alkimia of the Arabians—science and imagination, mystery and research, all bound up in the small term chemistry. Small wonder that the early experimenters thought direct color photography would be easy—after the wonders they had seen it is not surprising.

As far as I have been able to learn, real theoretical photography is not taught in this country. I suppose the reason is there is no one that wants to study it, but one thing I can assure the man who does begin to study the theory of his work and that is that he will begin to see the results in his work, both in ease of working and in certainty, and also—best of all—by the quality. I am not preaching any gospel of mechanism in photography, far, dear brothers, very far from it. I love good pictures in any medium, be they paintings, or etchings or gums or D. O. P., it matters not what, but what I am trying to tell in this mass of notes is just how some of the difficult things of photography can be made easier. If you can make good negatives, of just the kind you want every time, then are you free to concentrate your attention to composition, to lighting, and to pictorialism. And until you can make good negatives every time, I believe you are wasting your time trying to make pictures. It's like a man that is color blind painting tulips.

Get away from this old and extremely dead idea of "feeling" in a negative process. Any sort of negative can be made the scientific way, and if you make one that you like, it is an easy matter to produce another one just like it. It's not a matter of feeling,—it's a matter of light intensities on a piece of bromide paper in a meter—coupled with a certain number of seconds on the dial of a watch—coupled with a developer of standardised composition—with a thermometer of reasonable veridity in it—with a dark-room clock, and careful, sure, methodical work on the part of the operator. Then if he



SUNLIGHT ON CHALLIS HOUSE, SYDNEY.

HAROLD CAZNEAUX.

likes a negative that is ten per cent over exposed, and ten per cent under developed—if that gives the effect he is looking for, then he can produce negatives of that sort until his purse or the supply of gelatine runs short. If every point in the production of a negative is carefully systematized according to the Watkins methods, and certain variations give the results desired for any reason, then it is always easy to produce the same results, and the day of occasional satisfactory negatives will be at an end. The point of the whole thing—the gist of it all—the raison d'etre of the scientific method is this—the worker by guess, or feeling, or inspiration *sometimes* makes a good negative for his purpose and the worker by scientific methods, *sometimes* makes a bad one for his.

One last word I want to say—and I feel like Luther that I must say it even if there were as many devils about as there are tiles on the roof—if you want to make real pictures, leave celluloid film to those who don't.



BRONX PARK. JOSEPH LAURIER.



"LET'S PLAY HOOKEY." E. H. WESTON.

CARD-INDEXING PHOTOGRAPHIC INFORMATION

By A. LOCKETT

IT is needless to point out the advantage of having photographic formulæ, recipes, and other useful items of information so indexed that they may instantly be found. The same may be said of special details in text-books, interesting articles in the photographic press, addresses likely to be wanted, etc. Everyone knows how exasperating it is, when an unfamiliar piece of work is at hand, to have a hazy recollection of reading instructions for that very thing, at some indefinite period, "not long ago," but being quite unable to recall when or where. Hours, perhaps, are wasted, hunting in vain through back numbers of different periodicals, after which the disgusted worker usually transfers the trouble to some long-suffering editor, who keeps him waiting weeks for a reply in the "Questions and Answers" column.

All this is easily avoided by adopting the card-index system —one of our greatest modern conveniences—and making an inflexible resolution to record everything likely to be of future use. Those who wish to save the expense of the commercial article may readily obtain a cheap substitute by using an ordinary wooden negative box, the 5 in. x 4 in. size being most suitable. The grooveless kind should be secured if possible, otherwise the grooving will have to be removed. It should be noted that the box is one which takes the longer measurement of the plate horizontally, not upright. Plain white cards 5 in. x 3 in., the dimensions most in use, are best for the purpose. As the box will be deeper than the width of the cards, a piece of wood one inch thick and as large as the inside of the box should be cut to fit in the bottom, thus reducing the depth. A rectangular wooden block three inches high, about one and one-half inches thick, and a shade less than the width of the box will answer very well to keep the cards from falling while the receptacle is filling up. It is an

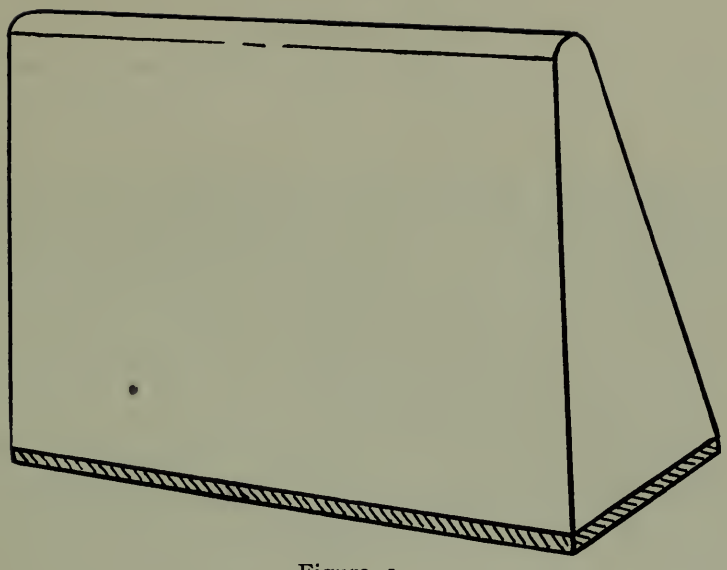


Figure 1.

improvement if this is tapered, as shown by Figure 1, and weighted at the bottom by nailing on a strip of sheet lead, as indicated by the shaded portion. A metal handle screwed at

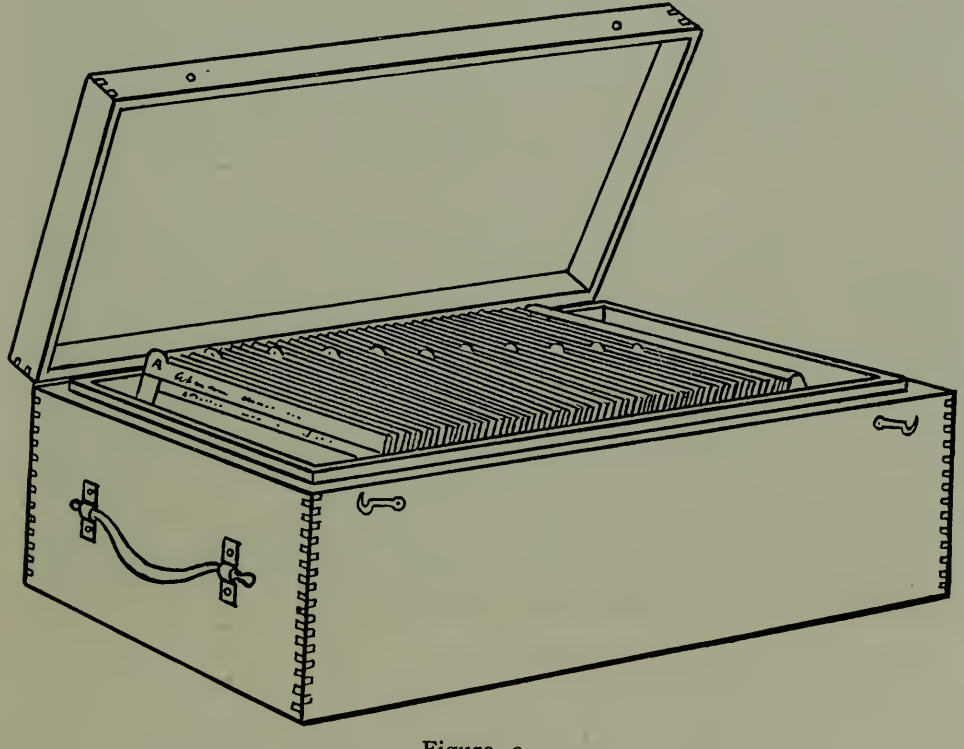


Figure 2.

one end of the box is an additional convenience. The appearance of the completed card index is illustrated by Figure 2.

Documents. Photographing.	
1	"Document Photography." "American
	Annual of Photography", 1911, p. 288.
2	"Copying Burnt and Faded Documents",
	"Brit. Jour. Phot.," July 9, 1909, p. 533.
3	"Copying Ancient Documents",
	"Photography", July 10, 1906, p. 29.
	(See also "Copying").

Figure 3.

A set of alphabetical index cards, to facilitate finding a given subject, is recommended, though not strictly indispensable. A small tray with a supply of blank cards should be kept at hand for making fresh entries as occasion arises, these being transferred to their proper places in the index at the beginning or end of each day. Entries are preferably made in good permanent black ink. Pencil, even the copying kind, soon becomes illegible by rubbing, while typewriting is often by no means so distinct as it might be, and sometimes has a tendency to fade.

The secret of a really useful card index is to have clear, definite headings and a logical system of grouping together all items dealing with the same subject. The principal heading, regarding which there ought to be little doubt, should be that under which particulars as to the book, volume, page, etc., where the information is to be found, are entered; while such extra headings as seem called for should be written on other cards, with simply a reference to the principal one. "Copying-easel," for example, should also be indexed under the heading "Easel, Copying"; while "Speculum Condenser for Enlarging" strictly requires two additional cards, headed respectively, "Condenser, Speculum, for Enlarging" and "Enlarging, Speculum Condenser for." Common-sense and restraint must, however, be exercised, avoiding palpably superfluous titles, which merely take up unnecessary room. A typical card with actual entries is illustrated by Figure 3. The numbers against



A SNOWY DAY, CITY HALL SQUARE, NEW YORK.

JOHN E. BOULTENHOUSE.

each entry are to save trouble in making notes for future reference, it being only necessary to take down the subject heading and the number.

The question of cross references demands an intelligent study. Many articles and paragraphs contain information relating to various subjects, or a single subject may be closely allied with another branch of work. In such cases several cross references may be required on different cards. Thus, an article dealing mainly with cameras may also contain details of special shutters, which should be separately indexed; some aspects of telephotography may need indexing under the heading of military photography; and so on. Experience alone can teach the most practical and useful methods of cross-indexing and how to keep a happy medium between overloading the index on the one hand, and, on the other, omitting essential headings that are bound to be referred to sooner or later.

Brief paragraphs in magazines and periodicals, when the latter not to be kept, may be pasted on cards with suitable headings and placed in the index. Short formulæ and recipes which cannot be cut out had better be transcribed on cards, as time is thereby saved when referring to them. Larger portions of text, whole articles, advertisements containing diagrams and details of apparatus—often not to be met with elsewhere—reproductions of notable photographs, etc., may be pasted in an album or kept in a file and their exact whereabouts appropriately indexed.

A simple and inexpensive home-made file is illustrated by Figure 4. It consists of a cover made from two pieces of stout strawboard, with a strip of linen glued on between for the back. The sides may be covered with brown or marbled paper, according to taste. A pair of long brass paper fasteners are inserted through cuts made with the point of a penknife near the inner edge of one cover, as shown at A and B, while the cuttings, pasted on sheets of plain paper as indicated, or entire leaves from periodicals, as the case may be, are inserted as required in the file by pressing them on the ends of the two fastenings and turning the latter down. Each page should be numbered as inserted—the numbers, of course, reading backwards—and a distinguishing letter should be gummed on the back of the file.

Trade catalogues, handbooks and pamphlets usually contain serviceable directions and formulæ, and it is as well to keep the really useful ones in a box or drawer, indexing the chief items and stating where they are to be found, as in "Box 1," "Drawer 3," and so on. Exhibition catalogues, too, are sometimes worth preserving and may yield acceptable accessions to the index.

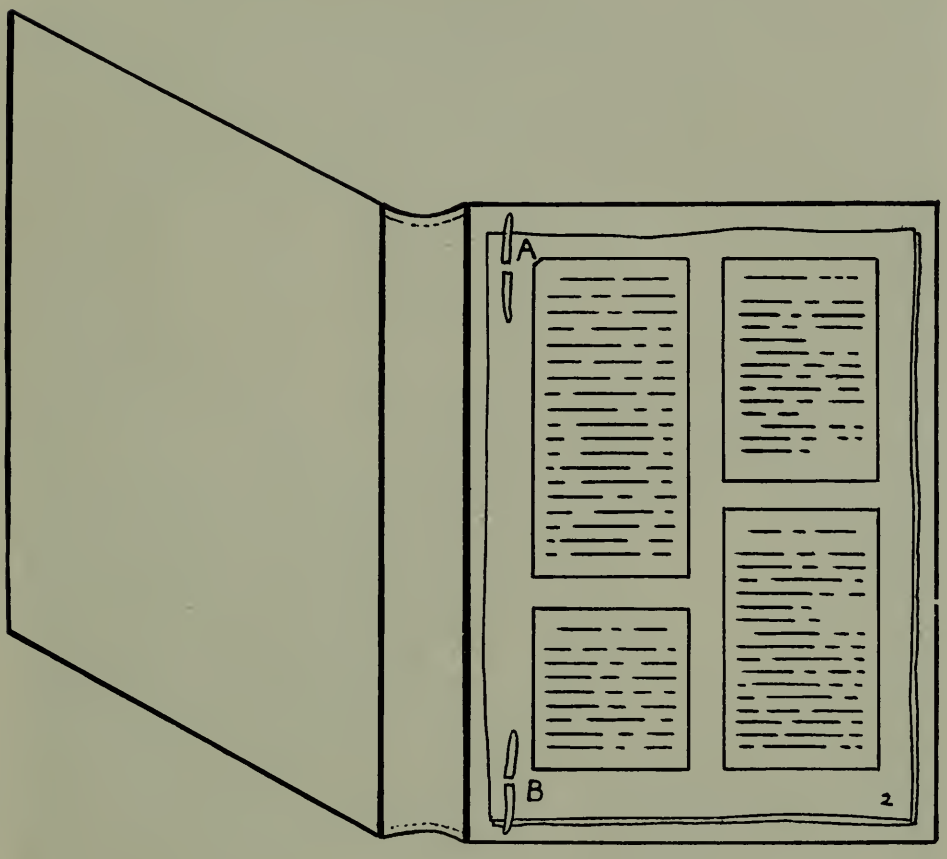


Figure 4.

Items not recognizably indexed in text-books, or not indexed at all (some text-books, especially early ones, are great sinners in this respect), should each have a card allotted to them. A warning may here be expedient against transferring items from the indexes of books to cards without first verifying them at the given pages, since it now and then happens that the wrong page number is quoted. Whenever such an error is detected the correct figures should be written also in the margin of the book index itself, to save future trouble.

All available sources of information may advantageously be indexed, not only those in the worker's possession. A note-book should be carried for jotting down anything that strikes attention away from home. Thus, if some useful data are seen in a volume at a public library, a note should be made of all essential particulars, indicating where and in what part of the building the work may be inspected. Such details, transferred to the card index, may prove invaluable later on.

If the number of subjects in which the worker has an interest is limited one box may suffice for a very long period. When, however, the index outgrows its accommodation a second box may be started. Labels should be gummed on the boxes to indicate the contents; thus, if two boxes are in use, they may be labelled, say, "A to L" and "M to Z," respectively. As fresh boxes are added new labels are affixed to suit the altered circumstances, taking care to keep the entire index strictly alphabetical.

The permanent value of a card index depends naturally on the care taken of it. It should not be referred to with wet or chemical-stained fingers, nor turned over with undue haste or roughness. If a card is removed to copy down a formula, or to carry to the bookshelf, it should be correctly replaced and not left lying about. The lid of the box should always be closed after use, to avoid the entrance of dust or dirt.

It may be stated, in conclusion, that the starting of such an index represents very much less labour than might be fancied from the description, and that, once begun, it is kept up with scarcely any trouble at all. As to its practical advantages, the writer can only say that he knows at least one photographer who gratefully acknowledges a saving of no less than ten pounds in six months' work by timely reference to a card index respecting doubtful points.



WHAT'S THAT! O. C. CONKLING.

SIMULTANEOUS DEVELOPING AND PRINTING OF BROMIDE ENLARGEMENTS

By HENRY A. PEABODY

THE majority of serious photographic workers are today using small and efficient cameras, depending on enlarging for their finished product. Consequently the process by which the enlargements are made becomes the medium of photographic expression. For all photographers know that it is not the negative but the finished print which is the final artistic product. The more chance for manipulation in making a print, the more art there will be in photography. This is what has made carbon and the oil and bromide processes so popular among pictorial photographers. On the other hand, bromide enlarging has been considered a mechanical process with little latitude for artistic expression. My purpose in writing this article is to suggest a means of enlarging bromide prints which has great advantages over the ordinary method and which gives the worker a chance to control the final result.

The method of simultaneous developing and printing of enlargements consists in placing a piece of bromide paper wet with developer upon the easel and then allowing the enlarged light image to act upon the wet paper causing it to print and develop at the same time.

The easel must be prepared for use with wet paper which is easily accomplished by painting the wood with white enamel paint. There should also be a metal trough or pan placed along the bottom edge to catch the drippings of developer which run down the face of the print.

A yellow light should be placed in position to shine upon the face of the easel in order that the appearance of the image may be judged while developing.

First, the focus of the picture should be obtained and two glass headed tacks placed in the upper corners of the image



WINTER IN DUBLIN. MRS. D. MAHONY.

to mark the position of the paper. The cap should then be placed upon the lens, and the paper, previously soaked in water to make it limp, should be placed in position on the easel where it will adhere without being fastened.

Mix up two ounces of developer to which is added a quarter of an ounce of glycerine. The following is a fine formula for this purpose.

STOCK SOLUTION.

Metol	8 grs.
Sodium Sulphite (dry)	150 grs.
Hydroquinine	30 grs.
Bromide of Potassium	15 grs.
Carbonate of Soda (dry)	300 grs.
Water	12 ounces.

For use take 1 ounce developer, ¾ ounce of water, ¼ ounce of glycerine. The stock solution will keep six months or more. Other developers may be used, provided they are quick acting, vigorous and non-staining.

Apply the developer with a rubberset camel's hair brush to the surface of the print after it is in position on the easel. When the paper is thoroughly saturated, remove the cap from the lens and expose the paper for a few seconds, taking care to under-expose the print, as the gradually building up of the image is the secret of the process. If too long an exposure be given at first, control of the development of the print will be lost. After this short exposure is given, cap the lens and wait for the image to develop which will take place in half a minute or more. Then if the image is too weak, give it more light and allow it to develop further, always remembering that the developer does not act as fast as the light, and the lens must be capped every few minutes to allow the development to act to the limit of the light action. While the lens is capped, keep the paper saturated with developer by brushing lightly over the surface. If any part of the print needs to be dodged, use a piece of cardboard as in the ordinary method of enlarging. But by this system the operator can see exactly where to shade and how much dodging must be done to bring about the desired result. Skies may be grayed, detail brought out in the most contrasty subjects, all under the eyes and



EVENING IN THE WOOD. A. R. F. Evershed.

control of the artist. It may take five or ten minutes to complete the print, but when it is finished the chances are that he will not be obliged to do his work over again.

When fully developed, the print should be removed directly to an acid hypo bath without previous rinsing. Washing in water after developing with a brush is likely to cause blisters as the emulsion softens somewhat from the prolonged development. But no blisters will be obtained if the above method is followed.

The same trouble may be experienced in judging the intensity of the print by yellow light as in the tray method of developing, the tendency being to remove the print from the easel before it is printed and developed deep enough, as the yellow light tends to make the print look darker than it really is. A little experience, however, will enable one to make the proper allowance for this.

One peculiarity of simultaneous developing and printing is that it will give a normal print from a normal negative and a normal print from a contrasty negative without changing the constituents of the developer. The reason for this is that wherever the silver image is developed, the light action on that part becomes slower on account of the coating of silver and as the thin parts of the negative develop first, they automatically slow up in developing thereby allowing the light to penetrate the dense parts on the negative before the shadows are overdeveloped.

This process is by no means fool proof. The worker who handles his wet paper with his fingers covered with hypo or who uses his solutions at a temperature of over 70 degrees will have stained prints to remind him of his carelessness. But with ordinary care such as should be used in any photographic work, he will find that this method of enlarging will give him a degree of control over the print hitherto impossible in bromide enlarging.



A DESERTED STREET. H. H. BROOK.

THE NEGLECTED STUDIO SHOW WINDOW

By JESSIE ROBINSON BISBEE

WALK through the streets of any town of less than ten thousand people, east or west, north or south, and watch carefully every studio show window that you see. There are the proverbial exceptions, to be sure, but the general average is an unpleasant surprise.

Here is a case in the middle of November still bearing the soap decorations of the Halloween merry-makers. Here is another studio, depending largely upon portraits, giving the best side of its limited show space to kodak work during the portrait harvest time, December. There are other cases where the same pictures are shown month after month. Like Tennyson's brook, they seem to remain forever.



Illustrating Article "The Neglected Studio Show Window," by Jessie Robinson Bisbee.

I have seen a basket ball dodger placed inside of a tiny street case across one of the two samples on display. Perhaps local enthusiasm and civic pride might be credited to this photographer at first glance, but such an excuse is not sufficient when the date of the circular shows that the ball game was played six weeks ago, and is now ancient history to all but the winning team which did not happen to be the home boys after all. One wonders if this photographer ever tried to estimate the number of people who pass his case daily, or if he ever figured just what rent he is paying on his show window. It is not surprising to see this man's Christmas advertisement running unchanged through the whole month of January. Think how the perplexed public must feel when reading in a newspaper dated January 30th that a free enlargement will be given to every one who sits for five-dollar-a-dozen portraits before December 1st at The Tardy Studio!

Such a policy always reminds me of one who spends so much time in filing and indexing old portrait negatives that he fails to realize that ninety nine out of every hundred who consider ordering from a negative over three months old are candidates for new sittings. It is so easy for all of us to live so fully in the past that we neglect the opportunities of the present, and fail to lay the foundation for the hope of the future.

I wonder often why more photographers do not make use of seasonable displays. I am not writing of the exclusive studio for few will ever own or manage one, but of the ordinary studio, the studio of the town or small city where the majority of the people may go and each find something suited to his purse and needs. Change may be the law of nature, but deadly monotony seems to be the law of too many photographers' showcases.

In contrast, I remember well this incident. A prominent Chautauqua platform director was to fill a return engagement in a town of fifteen thousand people. The place was small enough that I could see it caused considerable comment when one photographer showed a splendid enlargement of this favorite speaker on the opening day of the Chautauqua. I was not surprised to find that the photographer had won



PORTRAIT OF MRS. W. B. WILLARD. Fedora E. D. Brown.

medals in half a dozen states; his show case indicated ingenuity and ability.

By glancing at the window of any prosperous department store of today, even Rip Van Winkle could tell the season of the year. What matter though he has not seen a calendar for twenty years? Experts in window trimming have been paid to keep the spirit of the day in the beauty and skill of decoration that all who walk or ride, and even he who speeds by, may read. How many photographers might well regret to remember that for many years there has been no distinction between their Christmas and Easter windows, except in the rather small matter of change of portraits?

A good sample case is the best and cheapest of advertising. Then there is a personal growth and pride in getting from the beaten track in doing one's best in an original way, even though the result is not new.

There are things much more precious than the good round dollars which you expect your interesting showcase to entice into your studio. One of these things is the appreciation of seasonable and serial displays which you may be sure will be given to your work. You, the average photographer of the average people, will gain greatly in portrait profit through the introduction of such displays, but that is of the least importance.

The things of greatest importance are that school children will watch your change of pictures; busy mothers will take time to pass your door just to see how you have expressed each holiday. Children in go-carts are big enough to laugh with delight when they see the childish faces pictured among your Easter lilies, or in a game with the legendary white rabbits. They are big enough to catch some inspiration from YOUR version of "When the Flag Goes Marching By." They are big enough and eager enough to appreciate the mysteries of Christmas Eve which your camera has told in your own way.

No, the increased talk concerning your show window, with the advertising and financial value that it gives, is not of greatest importance to you. It is a minor detail when some man (and men have not usually been credited with interest in portraits) comes into your studio, a stranger in your town,

in no sense a photographic prospect; he has merely been gracious enough to come in and to introduce himself, that he might tell you what some feature of your display meant to him. And he had nothing to sell to you either! He bought nothing, but he gave you a courage that money can not buy. That is when you and I, the average photographers of the average people, will be glad that we have thought more deeply into the possibilities of the showcase than we used to do when we depended upon the conventional portraits.

The possibilities of the show-case? They are unlimited. Think of all the lovely poems of our childhood; then think of the dozens of children about us, "the living poems," who will give life and action to the written words. What more do we want? Only our trusty lens and dry plates, I am sure.

The possibilities of the show-case? Why have we been blind to them so long? It always required subjects, plates, chemicals and paper to fill our cases with pictures. Did we always use, also, tact, judgment and imagination? No stock house can furnish these last essentials but you, the average photographer of the average people, have them—and the greatest of these is imagination.

Only give yourself a chance and see where your imagination will lead you in serial portraiture. From here one of the doors of pictorial advertising swings wide open; this means more invention, more pleasure, more dollars, in short, it means so much pleasure and development that many of the dollars seem easily won.

Study, care and individuality will abolish every neglected show window in the land. Kipling gives a good formula for the attainment of this end:

"Each for the joy of working,
And each in his separate star
Shall draw the Thing as he sees it.
For the God of Things as they are."



Figure 1.

Illustrating Article "Personality," by George D. Jopson (*Page* 80).

PERSONALITY

By GEORGE D. JOPSON

NOT the personality of the photographer in his work but the personality of the "sitter." The bringing out of that something that is felt and realized by the immediate friends of the person posing. The throwing aside of all conventionalism and concentrating one's energy to obtain that something that illuminates the features, animates the pose and brings out the soul of the person, and striving to reach beyond a mere map or outlines of the features.

How many photographers have a customer bring with them a picture of some friend and request a sitting of themselves in just the same attitude? Ninety-nine chances out of a hundred we cannot come anywhere near a satisfactory picture for the sitter is too conscious of what she or he is doing, and the contour of figure and features is so radically different there fails to be a sense of harmony.

What should we do in such cases? Why! Just humor them. Give them what they ask for, and after relieving their mind of the picture question photograph them in our own way. Every person has some tender spot and it is up to the progressive photographer to hunt it out as quickly as possible. The customer may drop a little cue which can be followed up. A young lady brought in a picture of a friend. Figure 1 (page 79) is the duplicate pose. That was attended to at once. Her mind being freed from this special pose and photograph in general it became very easy to divert it in other channels—a reception she had lately attended. On her part all unconscious of the fact I obtained the result shown in Figure 2. Needless to say that is the only negative from which the order was finished.

Had given the model in Figure 3 a few different poses at her suggestions. She is a music teacher. Placed the pedestal near where she was sitting and entered into a "musical" conversation. We were riding her hobby. Unconsciously she



Figure 2.

Illustrating Article "Personality," by George D. Jopson.

assumed her attitude of resting her arms, one that is natural for her. Therefore this is the one that appeals to her friends.

To sum it up briefly, where superficial observation of a face can never discover its beauty, strength and characteristics, can never find the soul that lies behind, it behooves us to bring out the characteristics or brighter side of our models—such as will appeal to the loving friends with whom they associate daily. To do so the operator must possess tact—be quick to grasp the subjects that appeal to and interest the person posing. For to portray truthfully one must fully understand, and understanding will only come by cultivating the mind to instantly read human nature and discover at once the little or great things of life that most interests the person with whom we are dealing.



NORTH CHOIR AISLE, ELY. ARTHUR PLUNKETT.



Figure 3.

Illustrating Article "Personality," by George D. Jopson.

DEVELOPING LANTERN SLIDES

By G. ARCHER LINDSAY

"WHAT is worth doing is worth doing well" applies very much to lantern slide making. Never consider as tedious any manipulation or series thereof if thereby one can obtain the results desired.

The first essential point in making lantern slides—in fact all photographic work—is the necessity of knowing the result you wish to obtain. One must dig down till he has mastered every detail as to what each chemical and combination of chemicals is going to do for him, unless he is satisfied to take what he gets. If one is satisfied with the latter condition of things, then he may at times be surprised at the manner in which some slide stands out so far in excess in beauty and quality, that he is troubled and sorry that he is unaware of the WHY he was able to produce it.

Lantern slide making—that is perfect lantern slides—is made up of a series of manipulations, each in turn must have absolute care in every detail—none of which are difficult to even the ordinary worker, but which must be considered to obtain perfect results. In lantern slide making one must first and all the time give the greatest attention to detail. The least flaw in the negative will be duplicated in the lantern slide, which in turn will magnify it when thrown on the screen. The perfect slide must be free from every physical defect, and it does require some care even in the mounting to prevent an otherwise perfect slide from being greatly marred through nothing else but carelessness. Dust, finger marks, small hairs or fibres, &c., must be carefully removed before the absolutely clean cover glass is placed in position. In fact, the strictest attention to minute details and unlimited patience must be employed if one wishes to produce perfect slides.

It is a good plan to judge your slides in the lantern before mounting as sometimes a slide which looks well by transmitted



PORTRAIT OF T. M. JENKINS. Marie E. Jenkins Allen.

light, when thrown on the screen seems rather disappointing.

For neutral black tones no developer equals the ferrous oxalate. The iron developer will also produce a slide freer from fog than any other. The density of a slide may vary according to the quality of light used in the lantern. Very often a slide may be greatly improved by either reduction or intensification. The better slides are made by the copying process, but very good slides can be made by contact. When the latter method is used, and if the negative is a hard one, during exposure hold close to strong light and give full exposure. For a flat weak negative use a weak light and incline to under-exposure, and develop fully in a full strength developer, and give a slight reduction with Farmer's reducer.

For the best result you will find that a slow working plate is best—more latitude and freer from fog.

Developing Lantern Slides by Ferrous Oxalate.

Formula.

A. Solution	Sulphuric acid	30 mims.
	Warm water	20 oz.
	Proto Sulphate of Iron.....	5 oz.
	Dissolve Iron and then add acid.	
B. Solution	Potas. Oxalate (neutral).....	5 oz.
	Potas. Bromide	10 grains
	Warm water	20 oz.

The developer is to be used cold. Sulphate of Iron crystals must be clear and free from any rust or white powder. If not clear crystals wash them in water till clear and spread on a towel or blotter till dry, then weigh for use.

Always pour the A solution (Iron) into the B, not vice versa, or precipitation takes place. When A and B are mixed the solution should be a clear red.

To develop take one part of A and pour into four parts of B. When plate is developed far enough, i. e., when the high lights begin to veil over just a little, place into (without rinsing) a bath of

Glacial Acetic Acid.....	1 dram
Water	8 oz.

for from five to ten minutes. This is to prevent staining. Then into an acid hypo bath for ten minutes or so.

Another excellent Iron developer for lantern slides or bromide paper is

No. 1 Solution—Oxalate

Potas. Oxalate (neutral)	9 oz.
Warm water	30 oz.

No. 2 Solution—Iron

Iron Sulphate (pure)	3 oz.
Sulphuric Acid	10 drops
Warm water	10 oz.

The Sulphuric Acid to be added after Iron is dissolved.

No. 3 Solution—Potassium Bromide

Potas. Bromide	2 drams.
Water	3 oz.

The developer is to be used cold and in proportion of 5 oz. No. 1 (Oxalate Solution) and 1 oz. No. 2. Add 6 drops of No. 3. No. 2 (Iron) *must* be added to No. 3 (Oxalate). As development proceeds add more drops of No. 3 (Bromide Solution) if greater contrast is desired.

For prints, enlargements or lantern slides from weak, flat negatives, shorten the exposure but strengthen the developer by increase of No. 2 Solution (Iron).

For dense or hard negatives with strong contrasts give a full exposure and weaker developer by reducing quantity of No. 2 (Iron) Solution and using less of No. 3 (Bromide).

After development slides or prints should be placed in a clearing solution of 1 dram Glacial Acetic Acid in 8 oz. water for about five minutes. After clearing rinse well, then place in Acid fixing bath for about fifteen minutes. A good bath is

Sulphite Soda (dry)	½ oz.
Hypo	2 oz.
Water	20 oz.
Sulphuric Acid	20 mims.

or

Hypo	3 oz.
Metabisulphite of Potas	100 grains
Water up to	20 oz.

Lantern slides must always be well washed after Iron development to prevent stains.



"WHERE THE SLUMBER SHADOWS GO." RUPERT BRIDGE.



THE TWINS. EDITH L. WILLIS.

If a lantern plate has been rather under exposed a good accelerative is

Hypo	1 oz.
Water	25 oz.

using from 3 to 20 minims of hypo solution to each ounce of mixed developer.

According to Capt. Abney exposure can be reduced one-third by use of the hypo solution, but it is better to avoid its use if possible.

Ferrous Oxalate has no fogging effects, as it only acts on the silver that has been affected by the light. The Iron Solution does not keep well and should be kept in small bottles with waxed corks. The mixed developer also does not keep



PORTRAIT. Helmar Lerski.

well, therefore fresh developer is always desirable. If the water used contains lime there will be a precipitation which will be cleared in the Acid Clearing Bath.

The Iron developer is *the* developer for old stale plates as it will not produce markings or stains.

All traces of Pyro must be kept away from the Iron developer or black stains or markings will result from the combination of Pyro and Iron salts. Keep a set of dishes for Iron Oxalate alone.

In mixing Oxalate of Potas. Solution let stand twenty-four hours and decant off clear liquid for use. An alkali reaction means a bad quality of Oxalate and is unfit for use.



NARCISSUS. MARGARET L. BODINE.



Illustrating Article "Moonlight Pictures," by H. Oliver Bodine.

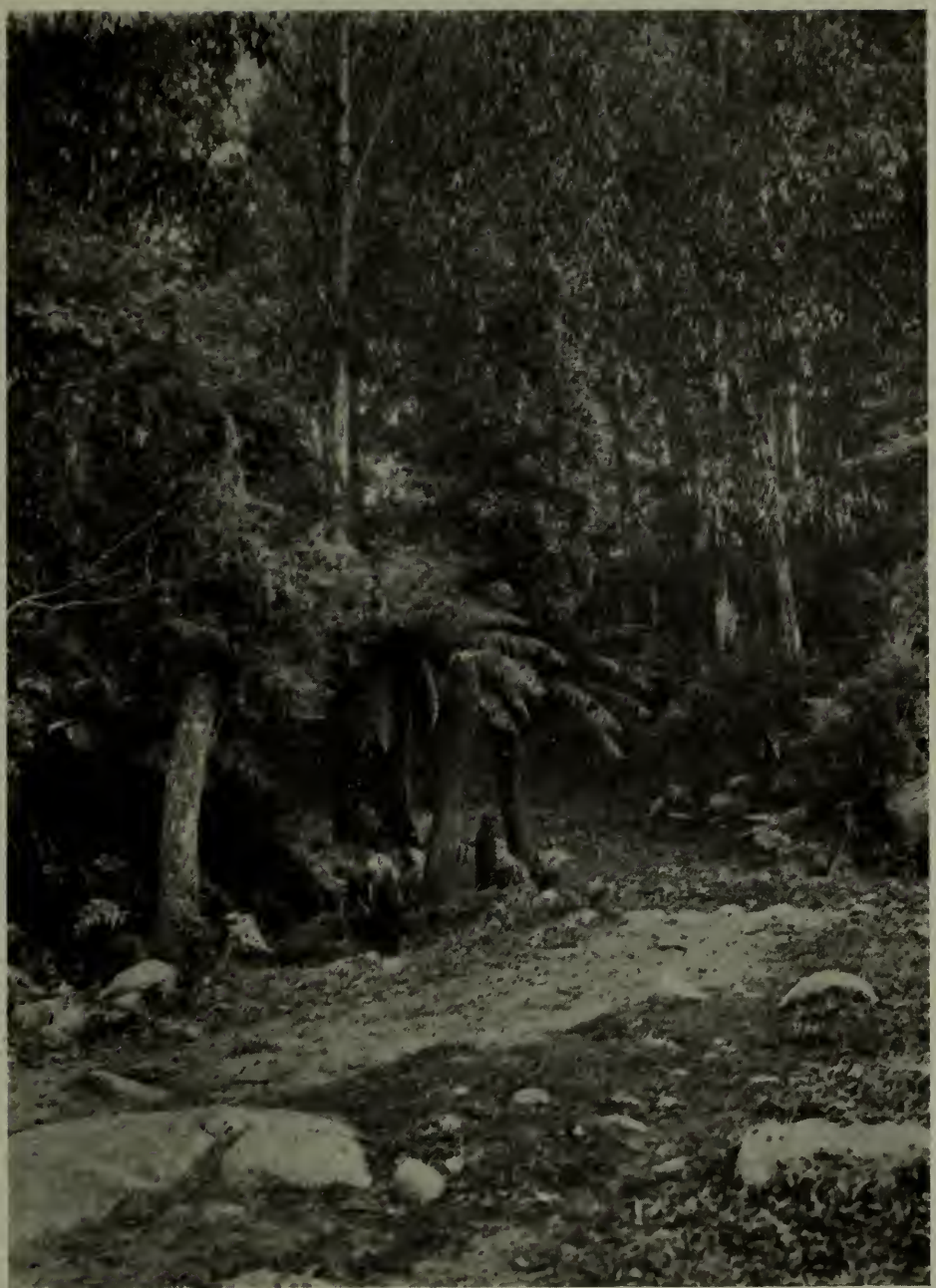
MOONLIGHT PICTURES

By H. OLIVER BODINE

ONE of the most fascinating branches of photography, and one that can be successfully mastered by any camera worker, is that of taking pictures which when finished have the appearance and effect of having been taken by moonlight. It is true that very beautiful effects can be obtained with nothing but the moon as a source of illumination, but the work is tedious, has many disappointments, and is only successful (to any great extent) with certain subjects.

For several years I made a specialty of moonlight pictures after having spent a number of years in other classes of work, such as landscapes, genre, speed, etc., and I must say that I received more real enjoyment in searching out and finding my moonlight pictures than in all the balance of my photographic work.

The majority of my negatives were made in the early spring, or late fall, at which times the cloud formations are most pronounced, assume the greatest variety of shapes and forms, when the sun gives a peculiar yellow radiance both in the early morn and late afternoon, and it will be found that these conditions are quite necessary for the making of successful moonlight pictures.



AN AUSTRALIAN BUSH ROAD. ERNEST A. BRAY.

One who has never had the great pleasure and privilege of watching the sun set through a bank of clouds in the late fall, or early spring, has missed one of the most beautiful and fascinating of nature's wonders, and this wondrous beauty will be enhanced many times if the camera worker views this same scene through the ground glass of his camera or the view finder of his kodak.

Water in the foreground adds to the effectiveness of moonlight pictures, especially so if the sun can be caught at a time when it is shining through the branches of a tree and casts a shadow of the same on the water, and here I will give an outline of a little trick, which will be of value when moonlight pictures are taken with water as a foreground. Before making your exposure cast a fair sized rock or stone into the water, either to the right or left of your picture, and wait for the riplets to work into your foreground before making the exposure. This will have a tendency to break up the smooth calm water which at best can only be termed an expanse of disinteresting white or gray, unless something is done to break up the monotony. The riplets will do it every time and will add to the beauty and effectiveness of the entire picture.

My exposures as a rule are made on either film or Orthochromatic plates without the use of a ray filter or screen of any kind, excepting in a very few instances. Exposures were, comparatively speaking, fast ones, averaging, I might say, 1/50 of a second. In developing I used an ordinary M. Q. solution, excepting that I decreased the amount of carbonate of soda to be found in the average formula by seventy-five per cent; in other words, I used one-quarter the amount of carbonate called for. This made a solution that worked slowly and which gave me what might be called a thin negative, which, by the way, is the only kind that I have ever found that will make prints giving the correct moonlight effect.

To sum the matter up, I give a rapid exposure, use a developer with a minimum amount of carbonate and develop for detail in the clouds only, letting the balance of the picture take care of itself. In printing, as a rule, I over-expose and



Illustrating Article "Moonlight Pictures," by H. Oliver Bodine.

slightly under-develop, thereby obtaining a print free from intense blacks, at the same time preserving detail, etc., in the clouds and avoiding unnecessary halation around the sun.

In trimming the prints endeavor to avoid placing the sun in the middle of the picture; have it to either side and above the center. Have never done any doctoring or faking of any kind on my negatives as I have found it is quite unnecessary when precaution is taken in exposure and development. I have seen some very fine moonlight pictures wherein the moon, etc., were worked in, yet I have never been an advocate of working up prints or negatives to any great extent because of

the fact that I believe that this is wholly unnecessary if thought and attention is given the matter before the exposure is made.

I have yet to find one of my friends whom I interested in moonlight pictures who has but the highest praise for this branch of photography, and many have told me that the greatest possible pleasure and enjoyment has been derived from looking for and finding those beautiful sunrises and sunsets in the spring and fall seasons when everything that nature has to do with seems to be at its best.



Illustrating Article "Moonlight Pictures," by H. Oliver Bodine.



Figure 1.
Illustrating Article "Speed and the Amateur," by T. W. Kilmer.

SPEED AND THE AMATEUR

By T. W. KILMER

SPEED and the amateur usually go hand in hand wandering through the photographic world.

To take a picture as fast as possible seems to be to many the highest type of photographic achievement. I remember not long ago being in a photo-supply shop and seeing a young man proudly exhibit to the proprietor a small print of a train in motion. "That was taken in 1/1000 part of a second," said the maker of the photograph. The train, although evidently going fast, was coming at an angle which did not in the least necessitate the use of a speed of over 1/200 second.

At baseball games, at horse races, at athletic events, I hear these questions all about me: "How fast is your lens?" "I use ——— plates, they are so much faster than ——— plates." "Your shutter isn't fast enough for baseball plays." After all is said and done the average amateur usually has with him

and uses more speed than there is any necessity of employing.

If you are the owner of an ordinary everyday hand or pocket camera test your instrument upon speed subjects, and get some idea of its capabilities before casting it aside and procuring F/4.5 lenses, plates of unusual rapidity and shutters working away up in the thousandths of a second.

True, there are times where the light is dull, or the day far spent, or an indoor study presents itself, where all the speed of lens and plate is none too great for the task at hand, but I am speaking generally of the use of too great speed on subjects that not only do not require it, but would be infinitely better without it.

We have all seen surf taken in 1/800 second. We have also seen runners, autos, etc., "stopped" in 1/1000 second. They look as motionless as though they had been photographed while standing still. I claim that the owner of a film or plate camera equipped with an anastigmatic lens of F/6.8, and having a between the lens shutter, working (and really working) at 1/250 second, is capable of producing as good so-called speed pictures as the fellow who lugs a fourteen-pound type of reflex camera.

Last year I happened to be standing next to a staff photographer of one of our city's largest daily papers. It was at the hurdle where some of Long Island's famous fox-hunters were being judged. I happened to have with me that day only a little 2¼ by 3¼ camera with a between the lens shutter working at 1/250 second. It was 4 o'clock in September; the shadows were somewhat long and the light was yellow. My neighbor was equipped with a 5 x 7 type of reflex camera, a large aperture lens, and said he had his shutter going at 1/900 second. As a large bay jumper cleared the bars we both let go at him. Several days afterward I met my friend again and asked him where his "stuff" was, as I had looked in vain for it in last week's photo supplement. He replied that the "light" had got him and all his stuff was "punk."

An 8 x 10 framed enlargement of the jumper (which some of my friends tell me looks like a contact print) shows that my 1/250 second was "speedy" enough (or rather was slow enough) to catch him even in the dim light. One of the best pictures of the Vanderbilt Cup Auto Race (so the donor of



Figure 2.

Illustrating Article "Speed and the Amateur," by T. W. Kilmer.

the cup tells me) I happened to get near the old "S" turn with a No. 3 Kodak and Sector shutter at 1/150 second, Eastman film, Dagor lens.

In an article by the writer last year published in "The Camera" there appears a rapidly moving baseball several inches before reaching the catcher's mit. This picture was taken with a Bis-Telar lens working at only F/7, and a compound shutter working at 1/250 second.

It also shows a runner sliding for the home plate. The three appended illustrations (Figures 1-2-3) show what can be done by any one owning a small roll film camera, an anastigmatic lens of F/6.8, and a between the lens shutter working at 1/250 second.

Speed is truly a good thing to have in reserve, but let us not forget that most of us have at our command sufficient speed, even when using what is termed an "ordinary" camera, to indelibly and effectively record impressions of rapidly moving objects.



A WINTER MORNING IN VENICE. CESARE L. LUZZATTI.



Figure 3.

Illustrating Article "Speed and the Amateur," by T. W. Kilmer.

SOME THOUGHTS ON HOME PORTRAITURE

By F. M. STEADMAN

IF the big photographer goes into home portraiture it will be on some plan or other organized and executed as a side issue, and subject to changes which the experience may suggest. This article is rather for the smaller man who needs to break away from a business that is not paying, or to add home portraiture to his present business.

Too many photographers in contemplating home portraiture as a business think of working it in a city or town in competition with the studios. This is wrong. The two large factors in any business are supply and demand, and the logical enticement of home portraiture is the demand—the active, ready demand—for photographs in villages and communities where no photographer is located. Go to the people who need you if you wish to get work easily and do a real service at the same time.

This then is for the small photographer who wants to make a trial at home work in some adjoining village which has no studio, and who needs to know just how to go at it, or to speak more modernly—"go to it."

One of the convenient phases of the business is that such trips may be made to different villages, and each trip serves as a separate experience and as a basis for improvement in methods of approaching the people and of finishing the work. First, let us suppose that the photographer wishes to make a quick experimental trip to some village that is near to the home town, going perhaps in the morning and returning in the evening. Such a trip is an awakener as it breaks in on the regular routine of the studio and furnishes new experiences and opens new points of view. But to organize such a short excursion for the first time is puzzling and here is where I wish to help.

Preparatory to such a trip I would advise that the photographer secure a film camera, say a 3A, the post card size,



Illustrating Article "Some Thoughts on Home Portraiture," by F. M. Steadman.

for one of the first things to do in home work is to eliminate the plate and the plate holder. According to the arithmetic we reduce pounds to ounces by multiplying by sixteen. Another very practical way to do it is to use films instead of plates. To adjust such a camera for home portraiture and any accurate work the focusing scale must be corrected and extended to shorter distances than the six feet on the focusing scale. Busts are made at about four feet and the scale is therefore inadequate. All that is necessary to prove the scale is to lay a ground glass across the two rollers where the film passes, fasten it there by any convenient means, and covering the head with a black cloth, as in focusing with plates, proceed to test the accuracy of each separate mark by actual trial on an object in sunlight at the distance indicated by each mark tested. And also for the closer distances up to the full extension of the bellows. One should focus with the lens entirely open and then use a magnifier so as to get the mark exactly in its correct position. The best plan is to scratch off the numbers of the old scale, if on celluloid, and make new ones that are correct. If the scale plate is of metal better remove it and put in its place a celluloid or thin cardboard one, long enough to take the full scale including the shorter distances.

Now, it is an actual fact that the average parent wants plain front views of their children, for the sake of likeness, and any photographer can undertake the lighting for such work without any previous experience. Simply get the subject *CLOSE TO ONE OF THE WINDOW CASINGS*. Being thus near the window softens the light by letting it come from a generous angle on the face. Children may be leaning with the head against the casing. A sheet held to catch the window light and to throw a reflected light back against the shaded side of the face balances the half tone and shadows perfectly if done with care.

With the camera close to the wall on the other side of the window from the subject, the exposure, if the window sash be raised away from between the face and the sky, and the subject be close to the window, will be about a quarter of a second with F/8 or number 4 on the kodak scale of stops, provided the sun be not too near the horizon.

The following sequence of acts will develop speed in work-



Illustrating article, "Some Thoughts on Home Portraiture," by F. M. Steadman.

ing: After getting the subject in the approximate position place the camera at the proper distance to give the correct size of figure on the film as seen in the finder. Second: Place the ring of the tape over some projecting part of the shutter or camera front, usually one of the standards, and carry the tape out to the head to get the distance. Third: Place the lens correctly in position on the scale. Then having the reflector in place and the subject in position the exposure may be made. Always shield the lens from strong light during the exposure.

By observing this method as a starter dark backgrounds will be the rule as the corners of rooms are usually rather shaded.

Now, on such a trial trip the real requirements are the camera, film, tripod and some half dozen sample pictures to show the kind of work. If you wish to save time and complications in this first experiment have only one style and size of finish. This reduces the problem to simply yes or no on the part of the person solicited.

If it is desired to make this a trip of several days and finish the work while out, then one can add two or three small trays, a ruby lamp, the chemicals for developing and fixing the films, and means for retouching, and the necessary paper and mounts. A suit case should be large enough to hold everything required.

With film clips a pair of films may be developed together in a small tray by first wetting the films in water and then placing them back to back and holding them with the clips. The solution must not be too shallow when developing two films at once.

A good developer for the road is dianol, as with the addition of sulphite of soda and a few drops of bromide solution it is ready to use, both for films and for prints. Make fresh for each pair of films. A simplified acid fixing bath for the prints is as follows: Eight ounces, or a common drinking glass of hypo, and an eighth of a teaspoon of metabisulphite of potassium. Pour on this four glasses of water and when dissolved add enough saturated solution of chrom alum to turn the solution slightly green. There should be only enough of the metabisulphite to make the bath acid by test with blue litmus paper, and enough of the chrom alum to turn the bath only slightly green.



THE BREATH OF SPRING. S. H. Willard.

It is a great saving in time to use powdered hypo. For the films fill a common glass a quarter full of the hypo and fill to three quarters full with water and dissolve. Pour it in one of the small trays and fix in the strip with the clips.

To be more explicit: Develop at night when the windows of your room may be easily darkened. Cover the table with several thicknesses of old newspapers, or better yet an oil cloth. If the wall is not white place a white paper against it so that the light of the ruby lamp may be thrown against it, thus giving a soft reflected light to work by. Place your watch in the light of the lamp to see the time plainly.

Arrange at the left a wash bowl of clean water, next to it the developing tray and then the hypo tray. The developer should be eight ounces of water, one and one-half drachms of anhydrous sulphite of soda and fifteen grains of dianol, to which has been added four drops of a saturated solution of bromide of potassium. With this developer a test of four minutes development will reveal the right development time according to your exposures, the make of film you use, the paper you will finish on, etc.

Make the hypo as already directed. When ready to develop open only two rolls of film and wet them one at a time in the water. When thoroughly wet, which only requires a quarter of a minute immersion, place the two films back to back and grip them with two clips. Now pass them in the tray of developer for four minutes. Pass them then in the water for a few seconds and then in the hypo until thoroughly fixed. The films may now be allowed to roll up separately and placed in water until all are developed and fixed. After six or eight changes of water they may be hung up to dry. They usually are dry in the morning when the proofs may be made and the orders taken. The retouching and printing should be done the same day and the work delivered the following morning.

Of course the photographer who can not at once secure a film camera, or who is prejudiced in favor of plates and the tank development, can use his regular view outfit on these trips. If the directions as to posing close to the window be followed closely it will be found that the exposures with a common window are much less than under the sky-light.

If adults are being taken, to get quicker exposures the top

sash of the window should be lowered instead of the lower sash raised as for children. With the subject a step from the window the exposure with stop 4 (U. S. as in the kodak scale) is from one to four seconds according to the strength of the light.

The finest hour for home portrait work among the trees or in a garden, by walls, etc., is a little before sunset. See that the person is placed before a suitable background and that the face is lighted somewhat from one side.

At a certain stage of my photographic experience the simple suggestions given in this article would have saved me from disaster, and I give this with my whole heart to those who may be in something of the same circumstances now. It is offered as the simplest possible way to make a trial trip into the field of home portraiture.



PEWTER WARE FROM HOLLAND. BURTON H. ALLBEE.



ON THE ROOF OF EUROPE.
The Summit of Mt. Blanc at Sunrise.

LOUIS J. STEELE.

DURATOL-HYDROCHINON

By DR. MALCOLM DEAN MILLER

IN last year's ANNUAL, through my own carelessness, there appeared a formula for duratol-hydrochinon in which I omitted to add the direction, "water to make 40 ounces." I am afraid that if any reader attempted to make up the formula as directed, with only 16 ounces of water, he met with failure; for this particular combination is much less soluble than most developing agents and shows a tendency to deposit crystals under a variety of circumstances. The crystals, to be sure, can be collected on a filter paper, dissolved in alcohol, and added to the bulk of the solution; or their formation can be prevented by adding alcohol in the first place. Since I conducted a series of tests and found that by mixing the sodium sulphite and the sodium carbonate intimately in the dry state before adding them to the duratol solution no precipitation of crystals results, I have had no trouble whatever.

In the spring of 1913 Mr. Livingston Mason, of Newport, R. I., called my attention to the use of potassium metabisulphite as an agent for preserving duratol and hydrochinon and allowing the use of a two-solution developer. I have since that time experimented incessantly, and now use exclusively the following formula, which is arranged for easy weighing, dispensing with the use of odd drams and grains.

A.	Water (cold)	32 ounces
	Potassium metabisulphite	60 grains
	Dissolve and add	
	Duratol	30 grains
	Hydrochinon	90 grains
B.	Water	32 ounces
	Sodium sulphite, anhydrous.....	1½ ounces
	Sodium carbonate, anhydrous.....	2 ounces

In making up, dissolve the metabisulphite completely in cold



MARGARET. Katharine Jamieson.

water. If hot water is used, it will decompose the salt and throw down sulphur. The developing agents can be added separately or together, and will dissolve in about a minute if well stirred. Filter, make up to 32 ounces, and bottle. The B solution, if made up with water containing lime salts, will throw down calcium carbonate and calcium sulphate on standing. When this happens I filter it and it remains perfectly clear to the last drop. No change whatever occurred in an A solution exposed to sunlight in a loosely corked bottle for six months. I use Metropolitan water, which is very hard; but have no trouble if I filter tank developer after mixing. I do not bother with filtering for a tray solution.

This developer is as near a good universal solution as anything I have tried. In some cases, complaints of fog are heard; but this is always due to improper proportion of sulphite. Piper and Mees pointed out some time ago that a hydrochinon developer would give sulphite fog if the proportion per ounce of that salt fell short of, or exceeded, certain narrow limits. Fog is not likely to occur save in tank development and can be prevented by adding 7½ grains of anhydrous sulphite for each ounce of water used in diluting. Personally, I dislike too brilliant a negative and find the proportions given above perfect for my water supply. With papers, a more decided blue-black can be obtained by substituting an equal weight (or more) of potassium carbonate crystals for the sodium salt. If desired, one can use more of the B solution than of the A in mixing a developer for this class of work; but I have always found equal parts satisfactory.

For gaslight papers and lantern slides, mix equal parts and add bromide only in minute quantities after its need has been shown by fog, or by too blue a tone. I never use bromide, as I find it hard to get a blue enough color nowadays, since all the manufacturers have been making their products to yield a warmer tone. A good pure black can be obtained with about one drop of ten per cent. bromide to each two or three ounces of mixed developer.

For bromide paper and tray development of plates and films, I find that one part of A, one part of B and two parts of water gives excellent results. The best average factor is ten. Duratol negatives are excellent printers, even when they look

very weak, and it is easily possible to get hard negatives by prolonging development. The developer belongs in the rapid class, being of about the same speed as the Watkins Thermo metol-quinol. I have not determined its temperature coefficient, but it must be not far from 1.9 or 2.0, as the same allowance for temperature suits it as in the case of the Watkins Thermo developers and Time developer, also pyro film tank powders.

When comparative prints are made on bromide paper with the manufacturers' own amidol and metol-hydro. formulas and with duratol, the latter yields prints of superior gradation. In fact, I consider it the best bromide developer to date. It works perfectly clear on fresh paper without addition of bromide solution, which would account for its yielding a fuller scale of gradation.

For tank, the best dilution is one part of A, one part of B, and four parts of water. At 65 degrees, the time of development varies from sixteen to twenty-four minutes, according to the development speed of the plate and the contrast desired. I give the shortest time to such plates as the Wellington Anti-Screen and other ortho. plates of the same class on the Watkins card; eighteen minutes for films and average plates of the 180 and 250 Watkins groups; twenty-two minutes for the 350 plates, and twenty-four minutes for the 500 plates. I also make an allowance of one minute for each degree over or under 65.



SHOREHAM.

Figure 2.
Illustrating Article "Some Notes on Composition," by Frank E. Huson.

SOME NOTES ON COMPOSITION

By FRANK E. HUSON

WHEN I look back upon the time when the word "composition" was an awesome one to me, and reviewing the paths through which a gradual understanding of the pictorial idea has been evolved, I feel that I can only give a rough guide to the beginner as to the manner in which his study of the subject is most likely to be beneficial to him.

It seems that the whole difficulty of composing a pictorial photograph lies in the fact that composition of line is quite easily understood, whilst composition of mass is of far greater importance and much less easy to understand, whilst beyond both there is the "soul" of the picture to be considered before we shall achieve success. If I lay down rules of composition and readers happen to look up reproductions of my pictures in various numbers of this ANNUAL and are unable to follow my arguments, or my rules, it may possibly be that

the idea of the picture was such as to practically do away with composition of line, making an harmonious massing of tone—the all-important.

The more successful a picture is in expression the less likely shall we be in tracing its composition. A picture that immediately reveals its construction can express very little feeling and is most likely only decorative, my picture in last year's ANNUAL being an example. To suggest an example of composition of line, which incidentally suggests composition of mass: Figure 1a represents a river, a house and a poplar tree depicted in about the most unsatisfactory manner possible. The two sides of the river running more or less parallel to the

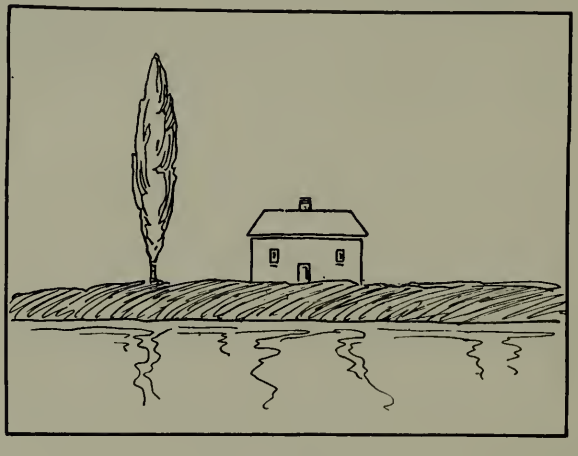


Figure 1a.

bottom, a tree and a house standing in glorious detachment! How much better such a subject would be treated so that the river leads into the picture, and the house and tree formed a conspicuous mass with perhaps a hill behind (Figure 1b). This illustration of the bad and the good will apply to a great variety of subjects, and particularly to seashore pictures where nothing is worse than attempting subjects looking out to sea with the waves breaking in parallel lines along the shore. The print "Shoreham" herewith (Figure 2) is a suggestion as to how dignity may be achieved under similar conditions.

To say a few words about composition in general: Always keep your highlight and dark in or near the principal object, and never let anything else compete with them in tone. Always keep your dark object near by and allow the remainder

to gradually recede by reason of the effects of atmosphere. Never take anything with the sun right behind you. Never try to take woodland scenes on grey days—you must either have sunshine or mist. Never leave a good subject after having exposed one plate—expose half a dozen under varying conditions, or slight re-arrangement. It will pay you better to photograph only one subject in a day and get a good thing than to try many more or less flippantly attempted. Ignore viewpoints that are published. You can be more original if you try. Do not expect to get a strong landscape and clouds

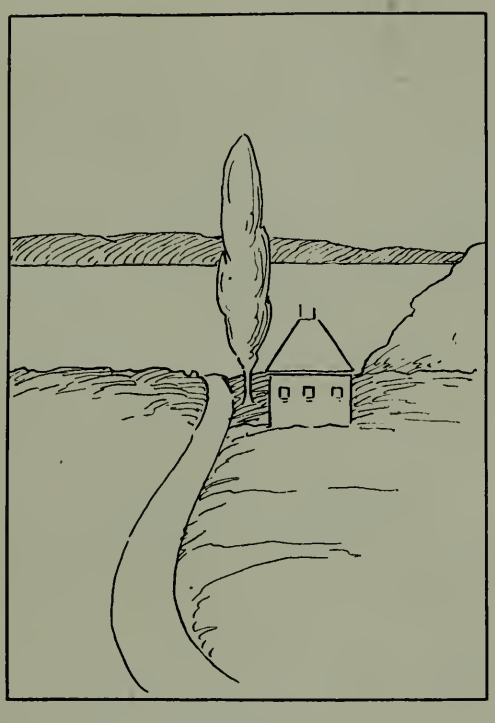


Figure 1b.

all at once, do the strong landscape; but if you want landscape and clouds, do light subjects. Take as little material as you can, and depend upon success by the play of light and shade—the composition that really counts.

Let us consider a picture by dissecting it—"The Farmyard" reproduced herewith (Figure 3). The original negative happens to be made with a very moderate priced instrument. The enlargement is in Bromoil and has been controlled with a view to getting broad treatment. The rick forms a strong foreground mass and has been kept low in tone. Behind, the

farmyard—the principal interest—holding the light tones massed near the dark one, a piece of sky, kept low so as not to take away the main interest, and the rest—simply treated. I am not putting this forward as high art, simply as a scheme of composition which I claim holds together, conveys the idea, and is more or less satisfactory pictorially.

I would leave the reader to study good work preferably in monochrome with a view to placing the lights and darks for the end in view, and not to worry himself about the balancing of lines, but to study the balancing of masses.



WIND BLOWN FUNGI. C. M. SHIPMAN.



Figure 3.

THE FARMYARD.

Illustrating Article "Some Notes on Composition," by Frank E. Huson.



A BIT OF NATURE'S HANDIWORK. CHARLES W. DOUTT.

COLOR PHOTOGRAPHY

By M. C. RYPINSKI

COLOR Photography on transparency plates has lately been so successfully brought within the reach of the average amateur, that it seems desirable at this time to give a brief statement of some of the underlying features of the best known processes. This will necessarily involve some consideration of the properties of light.

Light, according to the Undulatory theory, is a sensation produced on the retina of the eye by a wave motion of the ether, all light travelling with the same velocity, the difference in color sensation being due to differences in wave length and frequency.

Daylight, or white light, is a combination of color sensations and may be broken up as by a prism or a diffraction grating



CLOTILDE von DERP. —*Copyright by E. O. Hoppe.*

into its component spectral colors, red, orange, yellow, green, blue, indigo and violet.

Of these color sensations the red has the greatest wave length and the lowest frequency. The wave length decreases and the frequency correspondingly increases as we go on through the spectrum toward the violet.

Beyond the red is an invisible portion of the spectrum known as the infra red, and correspondingly beyond the violet we have the ultra violet, both of which are characterized by their chemical action upon light sensitive substances.

It has been shown that all of these colors, and indeed every color, may be reproduced by the proper combination of not more than three primary colors, red, green and blue.

Painters and printers are accustomed to regard red, yellow and blue as the three primaries, but this is due to their working with the subtractive method of color combination, i. e., the placing of colors one on top of another so that the final color is the resultant light reflected back to the eye after the original or light source has had subtracted from it all of the colors which the various color layers have the property of absorbing.

When rays of light encounter an object they are affected so far as color is concerned in two ways:

1:—By reflection,

2:—By absorption.

That is, there exists a property in matter which causes it to reflect from its boundary surfaces, rays of certain wave length and frequency and to absorb in its mass, rays of other wave length and frequency. All other rays pass uninterruptedly through its mass.

An opaque object is one which reflects or absorbs all light falling upon it.

A transparent object on the contrary allows some light to pass on through more or less unchanged.

For example, a blue blotter has an opaque blue appearance in ordinary white light because it absorbs all the red and green and reflects only the blue, transmitting no light; in red or green light it would appear black. A pane of clear window glass transmits all the primaries, red, green and blue, absorbing probably no light, white light, therefore, entering on one side emerges practically unchanged on the other.

Cobalt glass looks blue by transmitted white light because it absorbs the red, and green, leaving the blue to emerge practically unchanged.

An object, therefore, may have a very different appearance when viewed by transmitted light as compared to reflected light, and its appearance will also vary with the color of the light source.

Another variable is the color sensitiveness of the human eye. The normal eye sees all of the seven spectral colors, but there are color-blind individuals who lack the power to distinguish color in certain parts of the spectrum, generally the red end. In rare cases no color sensation exists at all, all objects appearing white or gray in tone.

In addition to the subtractive method of color combination, we have what is known as the additive method where the final net result is the addition of all the color components used.

For example, while most painters use the subtractive method of laying one color over another, there is a school of painting in which the color is laid on in the form of little dots arranged side by side. This is the additive method and gets its color combination from the inability of the eye to distinguish minute objects distinctly at a distance, the dots merging and forming a combination image of a color resultant which is the addition of all the colors of adjacent dots.

It is this latter method and corresponding optical characteristic which forms the basis of the three color processes with which this article will deal, viz., the Lumiere or Autochrome, the Dufay and the Paget.

Before proceeding to consider these processes in detail, it will be necessary to dwell for a moment on another characteristic of colored light, viz., the difference between its action on the retina of the eye, and its chemical effect upon a photographic plate.

We require of a photographic image that it shall duplicate in proper light relation the object as seen by the eye; however, the ordinary plate or film emulsion is insensitive to the yellow, red and infra red portions of the spectrum and highly sensitive to the ultra violet portion. An object, therefore, illuminated by the uninterrupted light of a bright portion of



GOOD-BYE.

FEDORA E. D. BROWN.

sky (which is composed in great part of ultra violet) will show greater contrasts between lights and shadows than actually exist to the eye.

On the other hand, blue and green will come out as white or light shades, whereas yellow and red will appear as black or dark shades instead of the reverse as viewed by the eye.

In order to correct this difficulty it is necessary to find some way of making the emulsion.

1:—Insensitive to ultra violet,

2:—Less sensitive to blue,

3:—Sensitive to red.

Considered additively the color yellow is a combination of red and green so that a transparent object which appears yellow by transmitted light is one which absorbs blue and transmits red and green. It is obvious, therefore, that we may accomplish 1 and 2 above, that is, eliminate the ultra violet and subdue the blue by interposing between the emulsion and object a yellow transparent filter of just the right hue to transmit the proper amount of blue.

The insensitiveness of the emulsion to yellow and red has been corrected by the comparatively recent discovery that certain dyes when mixed with the emulsion render it sensitive to the yellow and red end of the spectrum.

Plates or films rendered sensitive to the yellow as well as the blue and green portions of the spectrum are available and are classed as "Orthochromatic." Similarly there are available "Panchromatic" plates which are sensitive throughout the entire spectrum.

Curiously enough, a panchromatic emulsion is least sensitive to that portion of the spectrum to which the eye is most sensitive, that is, the yellow-green, so that unlike ordinary plates which are developed in a light of low luminosity to the eye, (red), a yellow-green, dark room light of good luminosity may be used. Of course, even the yellow-green is somewhat unsafe during the first stage of development, and naturally the safest procedure is to employ tank development, but generally speaking a panchromatic plate may be handled as readily as the ordinary non-color sensitive one.

We are now ready to consider the actual color transparency.



EVENING O'ER THE MARSH. F. W. Hill.

Take a transparent glass plate and rule one of its surfaces into rectangles one eighth inch square; then with a fine brush and transparent aniline dyes of the three primary colors fill in the rectangles, coloring them in order red, green, blue, red, green, blue, etc., until the entire surface is a completed Mosaic pattern.

Now take a panchromatic negative plate and assemble the two with the emulsion side of the panchromatic plate in close contact with the colored surface of the above Mosaic color screen. Place them in a plate holder with the glass side of the Mosaic screen facing out so that when the plate holder is in the camera the light traverses the Mosaic screen before it reaches the panchromatic emulsion.

Put a yellow filter in position before the camera lens and expose.

The exposure will probably be from twenty-five to one hundred times that of the ordinary plate, varying of course with the dyes used, the speed of the yellow filter and the speed of the panchromatic emulsion.

Separate the Mosaic screen and the panchromatic plate and develop the latter by a yellow-green light in a soft working developer. Fix and wash and when dry make a positive by contact on a slow working plate. Fix and wash and when dry adjust in contact with the original Mosaic screen until the proper coloring of the picture is obtained, when you will have a transparency in natural colors.

Let us see what has happened. During exposure the yellow filter operated to cut out the ultra violet and subdue the blue rays in the image. Falling on the Mosaic screen, therefore, was a colored image of the object corrected for ultra violet and blue;—the Mosaic screen being transparent, in turn allowed the light forming the image to proceed through and fall upon the panchromatic emulsion, practically unchanged, except that each one of the little Mosaic colored windows absorbed all light except that of its own color so in the red part of the image the emulsion was only reached and acted upon by light passing through the red windows; in the green part of the image the emulsion was only reached and acted upon by light passing through the green windows, and in the

blue part of the image the emulsion was only reached and acted upon by light passing through the blue windows.

Wherever the light passed through a window, the silver in the emulsion was altered and in development became more or less opaque, depending upon the amount of light action.

On the other hand, in the red part of the image no light passed through the green and blue windows; in the green none passed through the red and blue; in the blue none passed through the red and green. In development, therefore, these parts became transparent.

A negative was thus obtained, made up of black, grey and transparent rectangles so arranged as to form an image of the object.

Upon reversing the negative by making a contact positive, an image of the object was obtained, made up of transparent, grey and black rectangles, respectively.

Upon adjusting this positive over the Mosaic and looking through the two by transmitted light we saw the image of the object supplemented in the transparent portions by the color or colors transmitted by the Mosaic windows.

By following the above explanation through carefully, it will be noted that the transparent portions come only where light of the color of that part of the object corresponds to the color of the window of the screen through which it originally passed, thus giving us a representation of the object in its natural color.

In actual practice, of course, the rectangles of the Mosaic screen described would be too large to take advantage of the merging defect of the eye in observing small objects previously referred to, by means of which color combinations would be arrived at; they should not exceed one hundredth of an inch on a side.

Also it would require considerable experience to be able to select the proper aniline dyes and yellow filter.

Finally, the panchromatic emulsion would have to be special, so that the procedure above outlined is not offered as a means of obtaining color transparencies, but solely to illustrate the points brought out.

All the three processes herein described involve the elements above referred to, viz.,



CANON OF THE RIO DE LAS ANIMAS PERDIDAS. GEORGE L. BEAM.
Southwestern Colorado.

A Mosaic color screen,
A special panchromatic emulsion.
A special yellow filter.

They differ somewhat from the above description in that the Paget and Dufay employ a geometric recurring pattern of Mosaic screen (Figures 1 and 2), while the Lumiere is of an irregular non-recurring pattern (Figure 3).

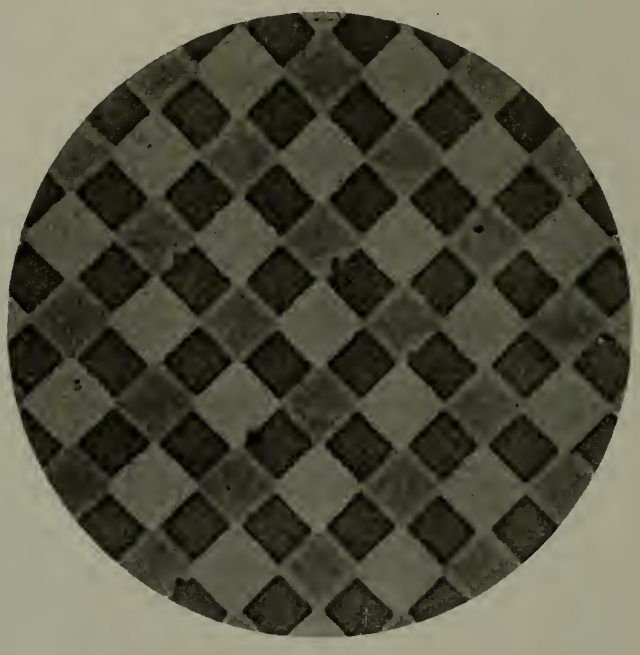


Figure 1.

Photomicrograph of Paget taking screen (duplicating process) red, green and blue rectangles approximately 1/500" square.

Also the emulsion is coated directly over the Mosaic screen instead of being on a separate plate, although the Paget people make a duplicating process which necessitates the Mosaic screen and panchromatic plate being separate.

It is obvious in the latter method that the Mosaic screen must be of a regular geometric pattern, otherwise it would be practically impossible to affect the final registration.

This is not necessary in the combined screen and plate process, for no registration is required, the negative emulsion being reversed to form a positive. This is accomplished by eliminating the fixing of the negative, and by placing the plate after development in a solution of bichromate or permanganate of potash where the exposed silver in its reduced

metallic form is dissolved out, leaving those portions of the plate transparent.



Figure 2.

Photomicrograph of Dufay Screen (combined process), red, green and blue lines approximately 1/500" wide.

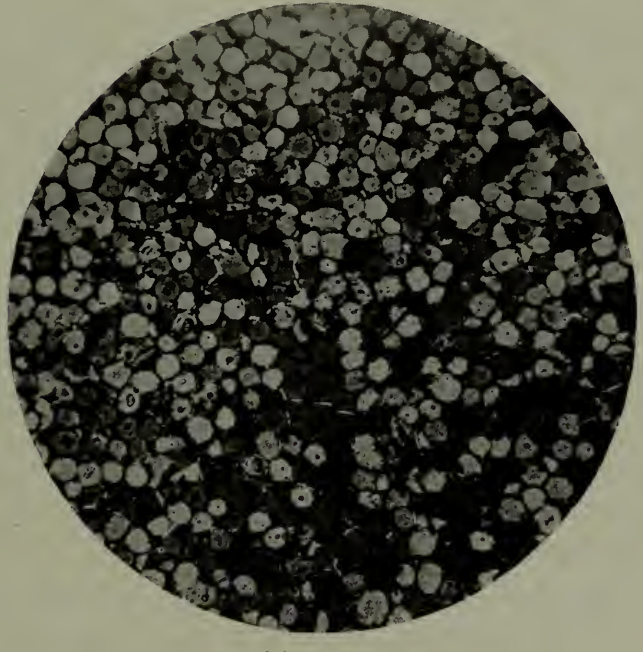


Figure 3.

Photomicrograph of Lumiere Screen (combined process), red, green and blue colored starch grains approximately 1/2000" in diameter.

The plate is then exposed to light when the unacted upon silver of the previous exposure becomes altered, and upon a

second development is reduced to a metallic opaque state, thus reversing the image.

The obvious disadvantage of this process is that only one transparency results from each exposure, whereas in the separate screen and plate process any number of contact positives can be made which in turn can be bound up with a Mosaic screen to form transparencies.

A comparison of advantages of the two methods may be of interest.

Combined Method:

1:—Speed in handling;—a transparency by this process may be made complete from exposure to final binding up, in thirty minutes.

2:—Ease of manipulation;—no more trouble to load than ordinary plates; less trouble to manipulate than ordinary plates.

3:—No registration difficulties.

Separate Method:

1:—Duplication;—any number of transparencies may be made from an original exposure.

2:—Expense;—the loss consequent on failures is limited to the panchromatic negative.

3:—Improved results;—the possibility of corrections in making the positive tends to improve the net results.

4:—Speed;—Not having to use the same screen for both taking and viewing, allows a taking screen to be employed of greater transparency and with adjustment for the difference in actinic value of the primary colors, thereby decreasing the exposure time.

5:—Monochrome prints. The panchromatic negative may be used for making prints in monochrome.

6:—Permanency—where the viewing screen is faded out by prolonged exposure to bright light, the colors may be restored by binding up with a new screen.

7:—Damage:—broken transparencies may be replaced by making a new positive and binding up with a new screen.



Figure 1.
Illustrating Article "Taking Your Own Picture," by C. H. Claudy.

TAKING YOUR OWN PICTURE

By C. H. CLAUDY

NOT all by yourself, unless for plain amusement, for you can usually get some one to snap the shutter for you when vanity or a hope to please your friends make the desire for a picture of yourself irresistible. But how often does it happen that you are a member of a group, a picnic party, or a boat-load of fun makers, yet must remain invisible in the picture you make of the crowd, simply because *you* make it? Not infrequently, too, when on tramps, "hikes," or other expeditions in which there are but you and one companion, some situation arises worth preserving in picture form, yet because one must manipulate the kodak, all the photographs must show *one* member of the expedition in lonely glory!

Yet it is perfectly possible so to arrange apparatus that you *can* be in the picture you make of a group—indeed, so that you and one companion may be engaged in some apparently vigorous operation and yet all the while you yourself are taking a picture of you yourself, and the other fellow, too!

Now, it would be comparatively easy to devise some sort of automatic shutter release, some affair of clock work and springs, triggers and balance wheels, which, when properly set, would go off like an alarm clock at some specified time and make the picture.

But the methods about to be described are practical, not theoretical—they are utterly without complication, and they *work,* which is the main point. If they seem either absurdly simple or rough to the point of crudeness, remember that when on a camping trip or a "hike" you don't want to carry much extra weight, or to stop overlong to adjust complicated machinery.

For the purpose of explaining intelligently about self picture taking arrangements, we must divide photographic shutters, as found on most amateurs' cameras, into two classes. Those I shall call Class A are such as are usually found on the folding type of kodaks which are operated by a little metal lever, or by a pneumatic bulb and tube. Those which I shall call Class B are the shutters usually found on the box type of kodaks, such as the Bull's Eye models, in which the shutter is operated by a little projecting lever of metal which is moved from one side to the other in a slot in the top of the camera box.

Let us say at the outset that self pictures of all kinds are more easily made when a Class A shutter is available than when a Class B must be used, although it is perfectly possible to do it with a Class B shutter.

In many shutters of the Class A type, the little metal shutter release, pressure upon which results in taking a picture just as if the bulb of the rubber tube were pressed, has a small hole through it. If it has, well and good. If it *hasn't,* the first thing to do is to drill a small hole in the end of this little lever, big enough for a fine fish line to go through.

The next thing to do is to obtain a few small screw eyes and put two in the wooden legs of the tripod, being careful

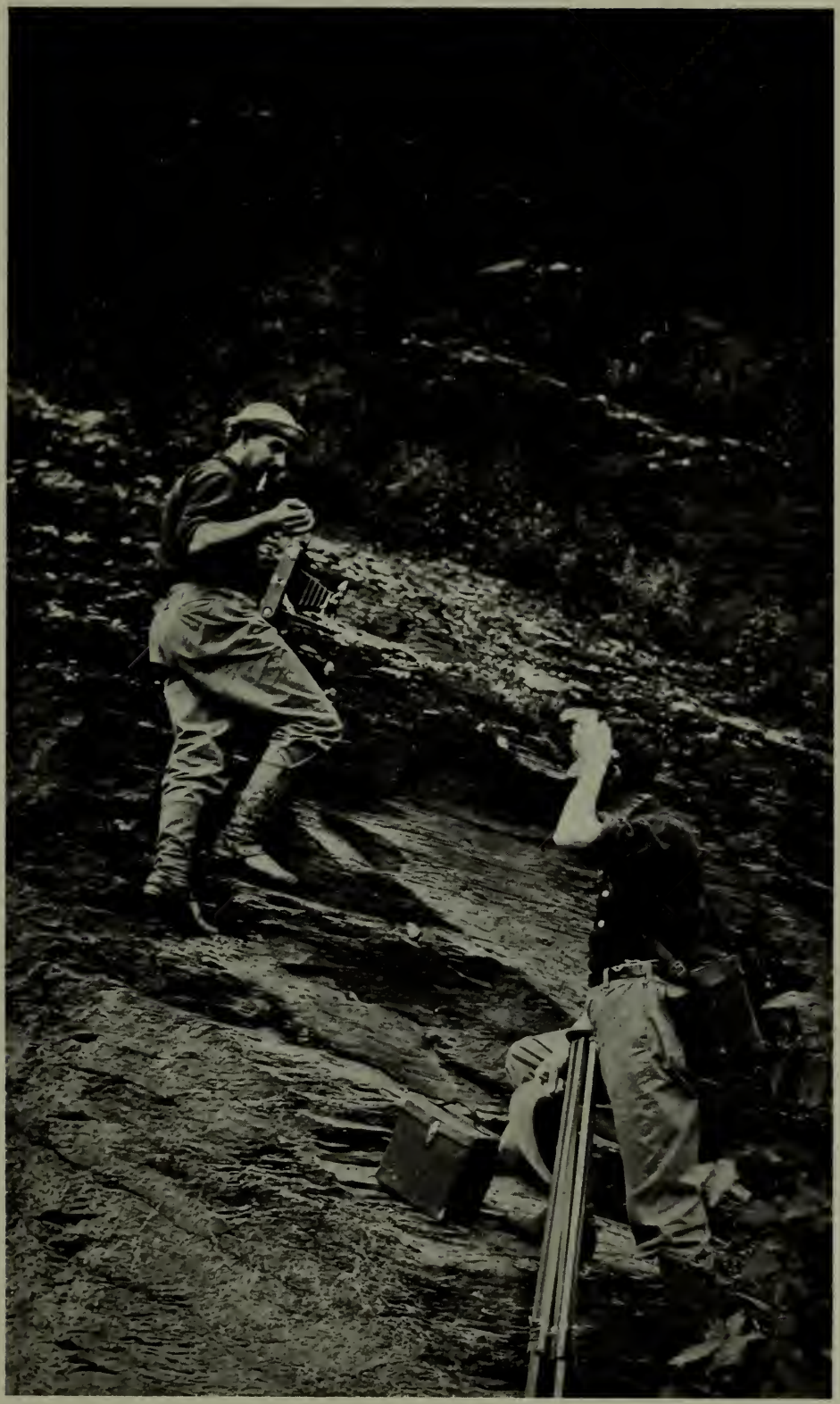


Figure 3.
"WHY DON'T YOU USE THIS KIND OF AN OUTFIT?"
Illustrating Article "Taking Your Own Picture," by C. H. Claudy.

that their position does not interfere with the folding of that accessory. Take a length of fine fish line—that fine braided line which comes at fifteen cents a spool is plenty good enough —slip one end through the two screw eyes, and finally through the little hole in the shutter release. Tie a couple of knots and your preparations are finished. The cord from the shutter you do *not* hold in your hand, as you have doubtless imagined. You take it and tie it to something so it is taut without being tight. A tree, bush, rock, chair—anything will do to hold it. Focus upon your group as usual, by scale, and



Figure 2.

be sure the film is turned and shutter set, and then take your seat or stand in the group. When you are ready to take the picture, you kick this string with your foot. The result is a picture in which you appear with your friends, your hands and arms are not in an awkward position, and the cord is quite invisible in the picture.

Accompanying this little paper are three photographs. All of them look as if made by a third person. Yet the two of us in the pictures were alone on a camping trip—very much alone, and far from any help, and we had to make our own pictures of ourselves as best we could. We used this string

method, and while the editor with a magnifying glass may perhaps see the cord, I am sure you will never find it in the reproductions, and I doubt you could in the originals. In the permanent camp scene (Figure 1) the man sitting is pulling the string with his right hand. Note the awkward position he is in. But in the picture showing tank development of film in camp (Figure 2), which of us is kicking the string?

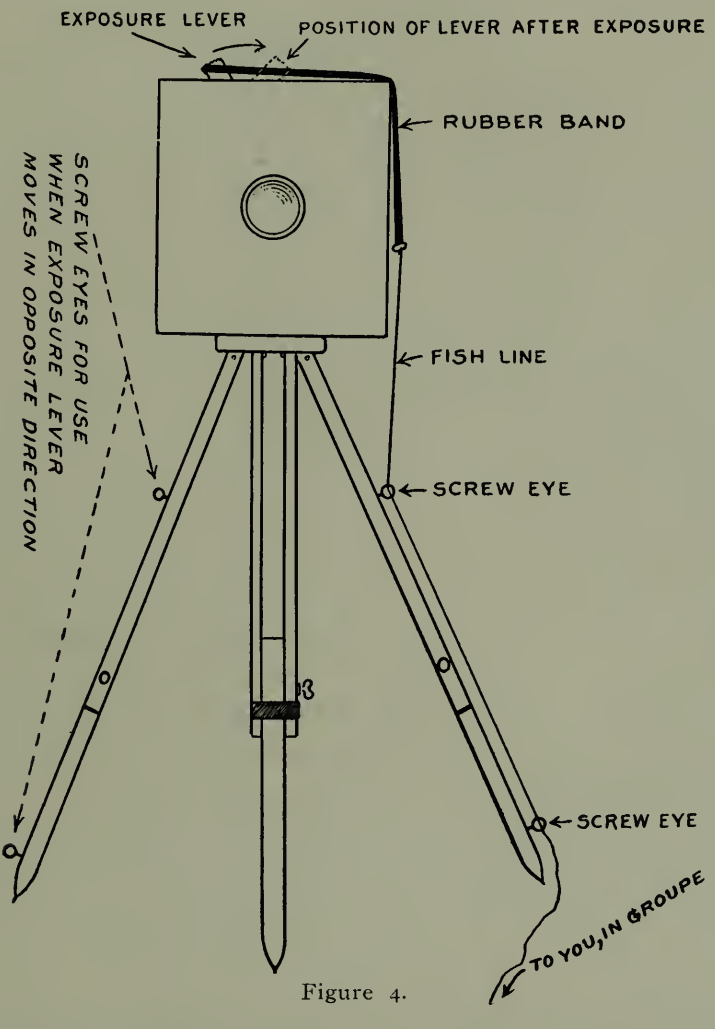


Figure 4.

Who made the exposure in the picture showing the difference in ease of mountain climbing with a kodak and a heavy plate camera? (Figure 3.)

If you have a camera with a Class B shutter, you still use the string and the screw eyes on the tripod, but you will have a little more difficulty. In the first place, the little lever in a Class B shutter moves from right to left to take one picture and from left to right to make the next one. So the pull of

the string must come from opposite sides at different times. Again, in the Class A shutter, the pull is directly *down*—in the Class B shutter it must be horizontal (if the little lever is on top of the kodak, where it usually is). The result is that if the string is led around the kodak, turning at right angles over its edge, so much friction is apt to develop that the string must be pulled very hard, and that not infrequently topples the whole outfit over in the dirt!

Of course you would probably guess the answer if you thought, but it is easier to read of some one else guessing. The answer is "rubber bands."

The string is made to end in a rubber band, such as an office clerk uses to hold documents together. It is looped over the little lever and the string tied to the other side of the loop of rubber. This rubber spring permits you to put tension on the cord, with your foot, very gently and slowly. When the rubber is stretched sufficiently, the little lever will fly over without any jar at all, and quickly and easily. If the rubber band were not in place, the slow pull of the cord *might* dislodge the camera. When the little lever must be moved from right to left, the rubber band is looped over one side of the kodak, and when it is to be moved from left to right, the rubber is to be looped on to the other side. (See sketch, Figure 4.) No matter what kind of an instrument you use, see that the tripod is firmly planted in the ground before trying self-exposures.

It is suggested that you do not look at the lens in making a self portrait, except you be in a laughing group, all of whom are making eyes at the unwinking one of brass and glass. The little pictures reproduced here—all of them made with the string, one by hand, and two with the moving foot—are natural as much for the apparent utter unconsciousness of the camera as from any other feature.

A spool of fish line, some rubber bands, and two screw eyes form a very small and certainly absurdly simple outfit to carry along when going afield with kodak and tripod. Yet it is more efficient than any affair of wheels and springs you could make, requires little skill and almost no trouble, needs, indeed, but the knowledge of the simple trick to be a great success—and that knowledge you now possess.



SONNY. GRETE BACK.

DETAIL IN PHOTOGRAPHY

By T. L. MEAD, JR.

THE slogan of most writers on the making of pictures by means of photographic processes is *simplicity of* composition, unity. That preachment is perfectly safe as its proper observance will always result in a print devoid of glaring faults, yet were it carried to its logical conclusion all such prints would be naught else but posters. Not that poster simplicity is objectionable in its proper place, but rather that the substance of the time-worn adage anent the spiciness of variety is more desirable for continuous association. This variety can be secured either by complexity of composition, or by fortifying simplicity of composition with detail.

True, the determination of which of these means is more desirable is largely a finding of the personal equation, yet there appear good reasons for deeming the latter course preferable.

Art whether literary, musical, pictorial, or whatnot, conforms to certain general rules, and one of these is the law of foils. This law ramifies all art. Its proper observance preserves interest in the story—be it short or long—broadens the harmony of music, and makes pictures satisfying. To be more explicit, in literature there are various structural forms; short story, novel, essay, poem, etc., yet each form has a main feature associated with minor features. In the novel the main plot is the basis of the work while the minor plots come in and distract the reader's attention for a time, then the thread of the story is returned to with renewed interest because of the digression. Without such minor plots the mind, lacking stimulus, would be offended at the mental effrontery and the novel would be termed insipid. Witness how one's interest is maintained in reading "Les Miserables."

Perchance some one will say that is a masterpiece and its immensity demands that its true pictorial parallel must be sought in the great painting—not in photographs. Very well,



SUNSHINE AND SHADOW. T. L. MEAD, JR.

who can read that little essay of Stevenson's "A Night Afield" without a sense of the supreme fitness of things—yet stripped of its rhetorical foils it is the merest bald statement, that a man camped in the open with his pack mule, for a night. Surely if homely simplicity in literature be the analog of photographs, the severest critic should be satisfied with the illustration.

As in letters, so in music, the use of minor themes is resorted to in order that the dominant theme may be strengthened and interest maintained.

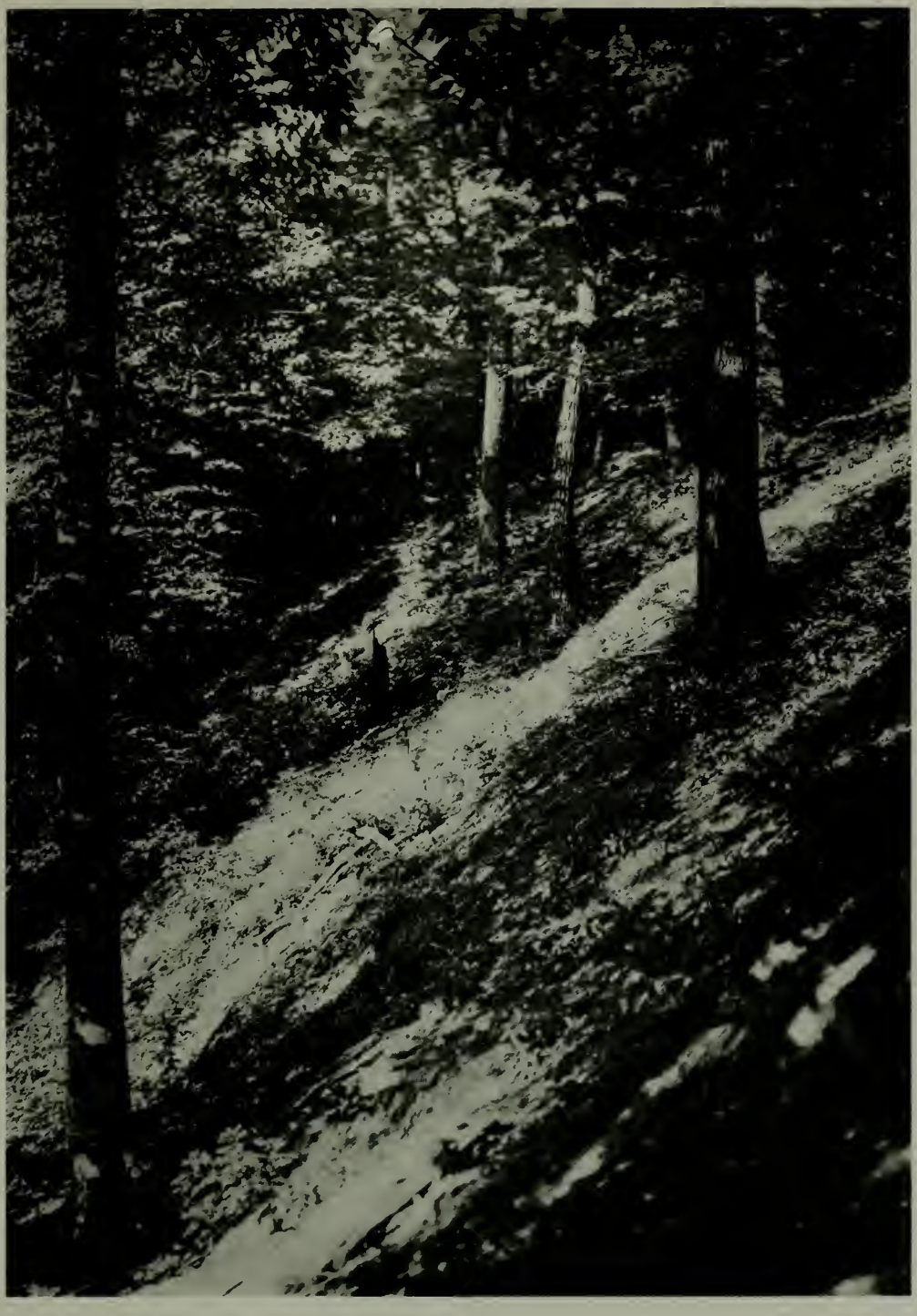
The story has it that Bill Nye once said, "They tell me Wagner's music is better than it sounds." It is a safe venture that had the wit been compelled to listen for long to music of the ravishing sweetness of Jossefy's with its one simple sweet strain, he would have noted a marked improvement in the sound of the music of that master of dissonance.

Yet again even as in literature and music, so in pictorial art. Among the pictures that have stood the test of time the largest proportion are those that have the principal object or point of interest supported with minor objects just as the minor themes which apparently detract from the "air" of a piece of music ultimately sustain that "air".

These foils must be rendered in such a way that they do not obtrude themselves, else we have a division of interest with the inevitable unrest of the mind perplexed in its effort to make out what the whole matter is about.

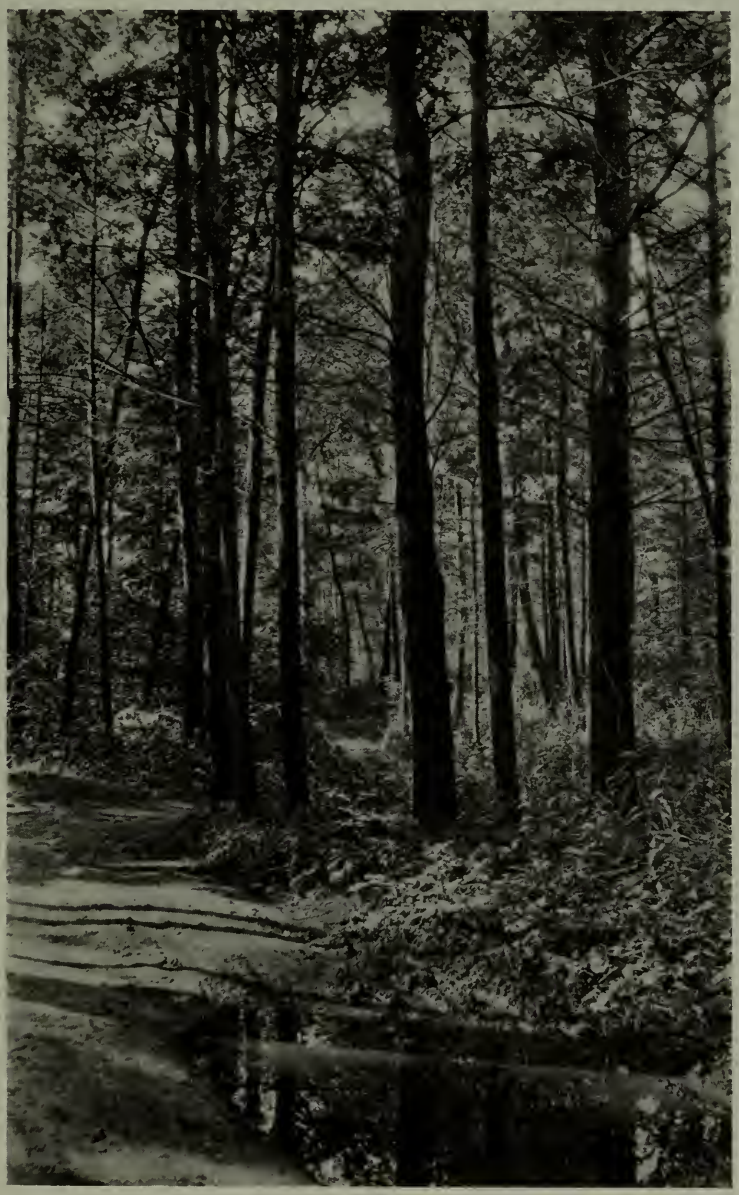
This is not saying that the foils shall not be of like quality with the main object, in fact, they must be in harmony with it. But they must ever be subordinate thereto and this may be secured either with variation of tone (aerial perspective), intensity, or arrangement.

This plea has nothing to do with fine definition as such. If the subject be best rendered with that sharpness of focus that delights the tyro or the ancient who has never waked up, let sharpness be present. If the subject can best be treated with broad masses, treat it so, always remembering there must be enough in those masses to tell the story, and detail sufficient to so link them together that the complete effect will be devoid of that spottiness which is ever wearying.



A RYTHM OF SUNSHINE. T. L. Mead, Jr.

The meat of the whole matter is this:—so blend and cover the lines that lead to the principal object, that the mind delights in discovering what would otherwise be self evident and of no interest.



THE POOL AT THE EDGE OF THE ROAD.

HARRY GORDON WILSON.



AN EARLY SNOW. CHESTER M. WHITNEY.

ARTISTIC PHOTOGRAPHS WITH INEXPENSIVE APPARATUS

By HORACE SYKES

HAD the venerable gentlemen of the North Western Photographer's Convention a few years ago when it was held at Seattle, Wash., known that two of the three little sepia platinum prints submitted by an art student, which were so much admired and given honors, were made with none other than a reading glass for a lens, and a piece of cardboard for a shutter, they probably would have expressed ridicule and contempt instead of admiration.

They did not know, however. The prints were conceded to be good, and one even was selected and sent to a neighboring convention as representative of the best work of the N. W. P. A. for the year.

Shortly after becoming an amateur photographer I became



Figure 1.

FRANCES.

Illustrating Article "Artistic Photographs with Inexpensive Apparatus," by Horace Sykes.



BESS.

Figure 2.

interested in the so-called "Fuzzygraph" style of work (or so it was called by a professional friend who did not admire it) and, of course, became ambitious along that line.

In drawing class I had learned to see things in masses, and to look for forms rather than detail. In the study of composition my teacher told me that good balance was obtained by opposing in their proper relationship forms, or masses of light and shade, or of color. I had also learned something about subduing the distant planes into more or less obscure



CHILD PORTRAIT. J. C. Strauss.

masses, or in color to do so by introducing misty blue and purple in order to introduce atmosphere. That, of course, gave the picture depth and the feeling of distance. All of these ideas made the product of my R. R. lens rather unsatisfactory from an artistic standpoint, and induced me to study how I might obtain the soft artistic effects such as I saw reproduced in the magazines.

I tried racking my R. R. lens out of focus and made a few studies. I did not like the effect. It was not the kind of softness I desired. I simmered them down some by printing through tissue paper, and such things, but that still didn't give the result. Just at that time a friend gave me an old enlarging box and led by my curiosity I took it to pieces, presumably to see what it was made of. Inside of it I found a simple convex lens an inch and a half in diameter which I discovered would form an image if held between eight and nine inches from a white cardboard. The idea naturally occurred to me why would it not make a photograph? I mounted it in a cardboard the size of the front board and hinged another piece of cardboard on the front like a door which I could swing back and forth with a string for a shutter.

To my astonishment I found that it made a sharp picture about the size of its own diameter, and that at the edge of the plate the image was so badly blurred as to be unrecognizable. At first I was disappointed because I had an idea I was going to do something, although I did not know just what. Then I thought why not try it for those soft effects I so much admired. It would not be interesting perhaps to tell of my experiences and failures with my reading glass lens (for such I termed it) and I did not do any great things with it. I succeeded in making some pictures which pleased my artistic sense very well, two of which met with the success previously mentioned.

The portrait (Frances, Figure 1) is the picture which was sent in the representative collection of the N. W. P. A. The one titled "Bess" (Figure 2) was made with a piece of black paper with a smaller hole in it used like a stop and shows better detail. Full aperture of the lens was used in the landscape study "The Brook" (Figure 3), and it shows evidences of all the aberrations and isms and such diseases which lenses are heir to.

It may not seem that I accomplished a great deal in working with this simple apparatus, but I did get great pleasure, with no little food for thought, on the theories of lens action, and much satisfaction at seeing the production of such meagre equipment passed upon so highly in comparison with productions of the best cameras and lenses of the Pacific Northwest.



EDENWALD. JOSEPH LAURIER.



Figure 3.

THE BROOK.

Illustrating Article "Artistic Photographs with Inexpensive Apparatus," by Horace Sykes.

THE GRAFLEX IN PICTORIAL PHOTOGRAPHY

By W. A. WARD

HOW many times during your photographic career have you accidentally stumbled on a scene which had the makings of a beautiful picture at that particular moment, but by the time you had your camera set up, your picture composed and in the proper focus, the picture which had impressed you was gone; the shifting of some portion of light or shade, or perhaps some person or object had moved out of range, destroying the harmony you wished to present. Perhaps you have proceeded to make an exposure even then with the expectations of getting something at any rate—only to receive a sad disappointment with the results later on. I know this has been my experience on more than one occasion when I have been afield with my view camera. I feel safe in assuming that hundreds of other enthusiasts have had the same sad story to tell on many occasions.

Perhaps a group of people in animated conversation make an appeal to your artistic instinct by the interested attitude which they unconsciously assume. An attempt to photograph them with a camera of any type but the reflecting one would be immediately frustrated by the attention you would surely attract.

In either of the above instances, the Graflex is the remedy, as a few seconds' work at any time will give you a record of your first impressions; and first impressions are in my case generally the best.

To illustrate the superiority of the Graflex for this class of work, I submit two prints.

"The Tar Boiler" (Figure 1) was made at an instant when the subject did not know he was under observation, securing a natural position of the worker, and making a picture full of interest instead of the "posed" record generally secured with other types of cameras.



Figure 1.

THE TAR BOILER.

Illustrating Article "The Graflex in Pictorial Photography," by W. A. Ward.

Again in Animal Photography the Graflex asserts itself. When they are grouped to your satisfaction, "bing!" you have them, instead of having them move away just about the time you would be ready to press the bulb with an outfit on the tripod.

My sheep study entitled "Arcadia" (Figure 2) was made under just such trying conditions during a cross country jaunt with a fellow enthusiast. On approaching an orchard we espied a few sheep grazing. The question at once was, Can we approach near enough to secure a picture without frightening them away? Well, to make it worse a fence stood between us and the sheep. With cameras ready, we approached the fence carefully, and as carefully climbed over. I was allowed not more than five seconds for making the exposure when the sheep scampered away. I was unable to make another exposure in an hour, as they took fright whenever we approached them. In the few seconds I was allowed to make this picture I was made a sworn friend of the Graflex for I know in no other way could I have secured so pleasing and successful a picture.

I could illustrate with many other prints, but I feel these two are sufficient to demonstrate that the Graflex was not made for speed work alone, but that it will do nearly everything that a view camera will do and many things that nothing but a Graflex will do.

Another argument I might present in favor of the Graflex in Pictorial Photography is this. Out of six prints I submitted to the Ninth American Salon, three were accepted. These three were all made with the Graflex—two of them are those used to illustrate this article.

The outfit I use is a 3¼ x 4¼ Auto Graflex with a 4 x 5 Zeiss Tessar lens, 1c, F/4.5, with a focal length of six inches, giving more satisfaction pictorially than if I used the 3¼ x 4¼ lens of five inch focal length, with which such an outfit is usually equipped, as the angle of view is much less, enabling one to get much better perspective.

If you are at all interested, try a Graflex or any reflecting camera, and be convinced that it is the camera "par excellence."



Figure 2.

ARCADIA.

Illustrating Article "The Graflex in Pictorial Photography," by W. A. Ward

TREATMENT

By EDWIN LOKER

TO the readers of this Annual, a writer's greatest ambition should be to contribute, if not something entirely new, at least something representing his own viewpoint of old material.

Now in the uplift of Art and the striving for beauty, the great geniuses of Culture have analyzed, dissected, formulated and classified, have given us laws of spacing, line, mass, color and what not, all of which can be embraced in the title of this article. Far be it from this endeavor to inflict upon the patient reader a further exposition of all these very necessary adjuncts to his training, which he can find most ably expounded in any library and in the most valuable photographic magazines of the day, but it is desired in selecting this all-embracing theme to attempt to divert the aims of the immense and growing army of photographers from the commonplace to an appreciation of the possibilities of photography as instrumental in bridging the chasm between nature and art. To a question of why, the answer is written in the thousand prints exhibited in trade windows, by the press, and in a myriad post cards. To the great question of how, from him who lacks special art training, you perhaps are best answered by having passed on to you from the writer the encouragement and incentive given him by one of our foremost artists and teachers. Upon questioning him as to the advisability of attending an art school in the essay to approach the higher ideals, he, knowing the whys and hows better than most, said, "Study pictures, my boy, study pictures," and further elucidated that the casual training likely to be imbibed by the average man, for whom this is written, the geniuses being a law unto themselves, would more confuse and hinder than help, but, that that tabloid advice "Study pictures," supplemented by proper reading, would put and keep you on the right track.



A POSE. Ryland W. Phillips.



Figure 1.

WHERE THE DEAD LEAF FELL.

Illustrating Article "Treatment," by Edwin Loker.

There is not the slightest doubt but that every one has negatives, the whole or part of which has merit, but simply placing in a frame, printing and letting it go at that does not constitute treatment, no matter how superlative your technique, but when you appreciate the fact that by using a particular portion of your negative, or by printing so the sunshine looks like sunshine and not whitewash, that shadows (clair obscure) have tones and gradation and are not expositions of your ignorance of the rudiments of exposure and development; when it is further grasped that by varying the printing medium to gum, oil, carbon or bromoil a very different and unique beauty can be imparted to the otherwise commonplace; that every picture has a "just right" size for its best expression, that its inspiration is best imparted to others by a rough or smooth paper, by printing in a high or low key, and so through the whole gamut.

In picturing the forest to not hide it behind the trees, as a learned critic has put it, or endeavor to show how much lumber it would cut; try and tell how cool it is, how seductive its shades; how noble its trees. In picturing the face the commonplace is avoided when the mere form of the features is the secondary object, and the main attention is given to depicting the mysterious fascinations of the human emotions. Learn the use of the lens as a drawing tool.

Both the illustrations herewith, "Where the Dead Leaf Fell" (Figure 1) and "The North Wind's Masonry" (Figure 2) were made with the camera way out of plumb, in the first being pointed downwards and askew in order to get the masses in graceful shapes, and in the second was tilted sideways to make a nearly flat horizon form a nice transitional line with the edge of the little rill in the foreground.

Try it some time.



Figure 2.

THE NORTH WIND'S MASONRY.

Illustrating article "Treatment," by Edwin Loker.

A UNIVERSAL DEVELOPER

By F. W. HILL

AN old subject, and one that a great deal has been written about, mostly by persons that had a new developer to sell, and in all cases about a developer that would do all things fairly well.

But I intend to treat the subject from a different standpoint; not for the needs of a raw amateur, who is satisfied with anything as long as it is a print or printable, but for the more advanced worker who knows what he wants to get in advance, and is willing to adapt his methods to meet the desired results.

We will start the process backwards, by making some prints first and our negatives later, as the results can be better observed in the prints. But first let us prepare our developer as follows:

A

Metol or Satropol.....	15 gr.
Sodium Sulphite (dry)..	80 "
Sodium Carbonate (dry).	60 "
Potassium Bromide	1 "
Water	5 oz.

B

Hydroquinone	15 gr.
Sodium Sulphite (dry)..	80 "
Sodium Carbonate (dry).	60 "
Potassium Bromide	1 "
Water	5 oz.

If crystallized sulphite or carbonate are used, use double the quantity.

Now let us expose two sheets of developing paper, Cyko, Velox, or any standard developing paper. Just a word about exposure. The correct normal exposure is one in which the developer will reduce all the silver acted upon by the light; in other words, the print will fully develop and then stop. Fur-



THE VERGER AT THE PRIOR'S DOOR,
ELY CATHEDRAL, ENGLAND.

DR. G. W. ALLYN.

ther development will not make it any darker, but will produce stain. If you find it necessary to take your prints out of the developer to prevent them from getting too dark, you are over-exposing, while, if they will not get dark enough, without staining, you are under-exposing.

Now, having determined our correct exposure by one or two test pieces, give our two prints the correct exposure and develop one in A and one in B. The print A (Figure 1) will develop very quickly, but will be very soft, the shadows will not be dense black, but of a blue-gray color, nor will the high



Figure 1.

lights be white paper, but of a soft gray tint; which means that this developer will be excellent for harsh negatives, giving us a soft print full of details instead of the usual black and white effect.

Now let us develop the other sheet in B (Figure 2). This will develop much slower, the whole paper seeming to fog over at first, and both the shadows and high lights gradually build up the former to a dense reddish black, and the latter to clear white, which shows that this developer would be the proper one for flat negatives, as it will increase the contrasts.

Now let us mix equal quantities of A and B together, and try a third sheet with the same exposure, and we will get a still different result—a combination of the two, not so soft as A alone, nor so harsh as B alone. The proportions of A and B can be varied to produce just the right effect desired.

Now let us try another experiment. We will expose another sheet of paper, but instead of giving it a normal exposure we will give it six times as long, that is, if we were giving the other, say, ten seconds, we will give this sixty. Now develop this in B.



Figure 2.

We find that it develops just as slowly as before, but starts in a warm red tone, gradually turning to sepia and a deep brown, and, of course, to a dense black if carried far enough, but should be taken out and placed in the hypo as soon as the desired shade is reached.

Exposures of as high as ten times normal can be made and very pleasing prints obtained from otherwise impossible negatives. Having carefully studied the working of these developers on paper, let us see how they will apply to plates.

Under-exposed plates are usually harsh. This means developer A for softer effect. For a known under-exposure, therefore, we will use A, but as we have found this a very rapid developer it will be better to dilute it with one or two parts of water, so as to give a little more time to observe results, in case they are not as much under-exposed as we think.

Over-exposed plates are full of detail, but are flat, and lack contrast; so for a known over-exposure we will use B, to increase contrasts. We have already found that good prints can be made with B when given ten times normal exposure, so we will find that good negatives can be made when developed in B, even with more than ten times normal. As B is a very slow developer, it can be used full strength for plates as well as paper.

In the case of doubtful exposures it is always advisable to start them in B. If, at the end of two or three minutes, they show no signs of the image starting, they can safely be transferred to A without washing.

Development, in all cases, except when double coated plates are used, should be carried until the high lights are shown clearly through to the back of the plate, regardless of how the front of plate may look.

With these two simple stock solutions, both of which will keep for months in tightly stoppered bottles, the camerist is able to make negatives or prints at will and obtain the desired results, provided he has taken reasonable care with his exposures.

Always err on the side of over-exposure, when possible, as you can hold back what you do not want, but you can never add what was not there in the first place.



BARDEN BEECHES,—MAY. W. H. Womersley.



Figure 4.

PUNCH BOWL.

Illustrating Article "History Through the Lens," by J. A. Anderson.

HISTORY THROUGH THE LENS

By J. A. ANDERSON

HISTORY and photography form an interesting combination. Many cameras are employed in many lands in obtaining pictured memorials of the past, but one who lacks opportunity to point his lens at Egypt's monuments or Babylonia's ruins may find abundant historic material in his own land.

A notable instance of this, in which the lens has recorded much of exceeding interest, is seen in the recently published volumes of "The Photographic History of the Civil War" in our now "united" states. In these the scenes and incidents of that dire conflict are portrayed with a realism of which it is difficult to estimate the value.

Although we must hope that active warfare among us will never again offer like opportunity, there is much upon which to employ the lens in securing memorials of this and our other wars, as well as of the peaceful doings of the past. A few instances may be cited by way of illustration.

In a "Down East" fort, of ancient build, the writer was permitted to photograph a "Portcullis" of olden type (Figure 1), such as was used for excluding enemies at a period when the means of attack and defense were less formidable than



Figure 1.
PORTCULLIS, FORT CONSTITUTION,
NEW CASTLE, N. H.

those of today. This naturally led to inquiry respecting former methods of warfare and the history of the old fortification.

Not far away from this fort, in a building devoted to the cultivation of the spirit of peace, an exposure of five minutes, in semi-darkness, resulted in a picture of a chair of handsome, antique pattern, which had been presented to the church by an English queen and further honored by having once been occupied, during service, by the venerated Father of our country. Again an incentive to research. Who was the queen? What was the occasion of the gift? What was

Washington's habit as a church goer? Turning to one of our southern states, we come upon the walls of a fort (Figure 2) still older than the one above mentioned, respecting the origin of which nothing could be gathered beyond the surmise that it may have been constructed by early settlers for protection against attack by Spaniards or Red Men.

These walls, laid with a mixture of lime and shells, known as "tabby", and as solid and unbroken as when built, but for a crack from earthquake shock, witnessed bloody encounters



Figure 2.
DORCHESTER FORT ON THE ASHLEY RIVER, SOUTH CAROLINA.

when Charleston and neighboring posts were held by the British. Here opens a large field for the study of an interesting period in the Revolutionary struggle.

A further incentive to learning something of the same troublous times exists in the vicinity of the last. This is a handsome silver drinking cup (Figure 3) once the property of Gen. Francis Marion, the "Swamp Fox" of the revolution who, from his shifting "Headquarters in the South Carolina swamps," did so much daring and efficient work in harassing



Figure 3.
GEN. MARION'S SILVER DRINKING CUP.

the British and protecting the neighborhood from their ravages.

Going north again, the locality in which the writer has his home fairly bristles with historic memorials. The Historical Society of a neighboring county has gathered many photographs of these into attractive albums, forming a collection of rare interest in illustrating the doings of our predecessors, in peace as well as war.

A negative by the writer, presenting a picture of a quaint old church, supplied, after destruction of the building by fire,

many prints which served as mementos for members of the congregation and as aid in making up a rebuilding fund.

An old Daguerreotype was discovered which represented a church building still older than the other, but long since displaced. A reproduction of this made a valued addition to the church records and was much prized by the survivors of those who had known the old structure and by others who, with them, worshipped in its successor.

In the same locality are many reminders of "the times that tried men's souls" in the Revolutionary contest. Dwellings still standing are memorable from having been occupied by Washington and his generals; remains of earthworks made under their direction are pointed out; other mementos include some fishing tackle that once belonged to Washington, and a punchbowl (Figure 4) from which he was once served; a modest monument marks the resting place of one who aided in bearing the body of Washington to the tomb; near by is the dwelling in which were spent some of the boyhood years of the discoverer of California gold and, a few miles away, is the scene of the ever memorable "Crossing" of the Delaware in the advance of the American forces upon the Hessian post at Trenton, N. J.

This brief list will serve as hints to the photographer who may be disposed to add to his collection of prints such as are of historic interest. A well known painting, purporting to present a view of an event of great historic importance, although grossly inaccurate in detail of the objects included, has a wide popularity from its connection with a critical period in our country's history. The more accurate photograph, whatever may be its artistic merit, may well have its value enhanced by like association.

As a rule, the historic instinct is not apt to be developed in early life. Coming later, it grows with advancing years. It is hoped, however, that this presentation may inspire some, even of the younger people, to use the camera in the way suggested and, while obtaining interesting records of the past, to find pleasure and advantage in the mental stimulus and increased knowledge gained in the pursuit.

SOME PHOTOGRAPHIC HELPS NOT GENERALLY KNOWN

By WILLIAM H. ZERBE

Removing yellow stains from gaslight paper.

THERE are times when developing gaslight paper, owing to under-exposure, forced development or stale developer, the print will show a yellow stain and will be fit only to throw away.

The following will remove the stain entirely and make the print perfectly good, providing it has been developed to the proper color.

STOCK SOLUTION.

Water	10	ounces
Sulphate of Iron granular	1½	ounces
Sulphuric Acid C.P.	½	ounce
Powdered Alum	½	ounce

After the print has been thoroughly fixed and slightly washed, lay the print face up on a piece of glass, or in a flat bottom tray, take a piece of absorbent cotton soaked with some of the stock solution, and rub it quickly over the stained part of the print, or over the whole of the print for that matter, and the yellow stain will disappear instantly. After this is done wash the print thoroughly in water. The Iron Solution must not remain on the print too long for it has a bleaching or reducing effect. If prints are only slightly stained a weak solution of the stain remover may be made up in a tray and the print soaked in it until the stain disappears. One ounce of stock solution to six ounces of water makes a good working solution. Stains are not so easily removed if the print is allowed to dry. It is advisable to clear them up after fixing. If it is intended to redevelop the print to sepia the iron solution must be thoroughly washed off. If any of the iron remains in the print, when the ferricyanide which is in the bleaching solution of the redeveloper comes in contact with the print, it will turn blue.



AN IMPRESSION OF THE WOOLWORTH BUILDING.

WM. H. ZERBE.

A Quick Fixing Bath.

Fixing the unreduced silver from a negative may be done in one quarter the time, by the addition of chloride of ammonium to the regular fixing baths, 1 ounce of chloride of ammonium (granular) stirred until dissolved is all that is necessary. This quick bath is quite an advantage when double coated plates are used.

A substitute for formalin in hardening the gelatine on plates.

STOCK SOLUTION.

Water	16 ounces
Table Salt	3 ounces
Powdered Alum	3 ounces

After the negative is taken from the fixing bath and given a little rinsing, it is put in a bath which contains 8 ounces of water to 2 ounces of stock solution.

It is well known that alum and salt is used for tanning hides which are of a gelatinous substance, alum and salt has a similar effect on the gelatine in a negative.

A cheap dry mounting press.

Dry mounting is a clean and effective method to mount prints and keep the print from curling, but it is not such an easy method to do satisfactorily with the ordinary sad irons which are recommended, when one cannot afford the expensive press used for the purpose.

A very cheap and just as practical a press can be made from a piece of soap stone slab. Dealers in household goods sell soap stone griddles at a small cost, or your plumber may give you a piece from a broken wash tub which can be cut into shape with an old saw.

Prepare the print for mounting in the usual way and heat the soap stone in an oven to the right temperature, lay mount and print on a flat surface and place the hot slab on top of print with a piece of paper between, and in a few minutes it may be removed. The hot stone can be easily handled with a piece of cloth, as it is not necessary to get it so hot that it would scorch the cloths.



NOVEMBER MISTS. A. F. Muhr.

MODIFYING DEVELOPERS

By H. M. LONG

"GET it in the negative" is the soundest advice ever given the man or woman who uses the camera as a means of recording the things that please the eye. But it seems that only those who are in the advanced class, the college students as it were, are alive to the really important part development plays.

There is the ever present amateur who develops every exposure with the same developer. Snapshots of known under exposure and time exposures go through the same solution, without regard for what treatment should be accorded to secure the best results. If these amateurs will experiment they will find a new field opened before them—and they will get better negatives.

Every person who develops a negative ought to know something of the construction of the plate or film as well as the component parts of the developer and what each chemical is intended to do.

Naturally the ideal developer is the one that the operator mixes to suit himself, using usually some tried formula, and if pyro is used, having the stock solutions, reducer, sulphite and carbonate separate. With other reducers it does not make so much difference about sulphite separate as the color is not so amenable to control as with pyro.

Let the user of prepared developing powders experiment a little with water. Add twice what the directions call for, or even more, unless there is eikonogen in the developer, and see what results. There will be a general reduction of contrasts. If the plate is under exposed you will get much more than with forced development. Eikonogen in weak solution is very liable to stain and must be used carefully.

It is in use of stock solutions that the greatest latitude is

experienced. The pyro user knows that with his three bottles and known exposure he may determine absolutely the kind of negative he will produce. Starting with water, he knows more reduces contrast and less adds to the contrast. He has the widest range in this point. The amount of puro has its effect. More adds to contrast while less decreases it. The amount of alkali acts similarly. It is the alkali that opens the pores of the films, allowing the developer to reduce the silver. Carbonate of soda is more generally used than the potassium. The sulphite, the preservative, controls the color, and thereby the printing quality. More sulphite makes a black negative, but quick printing, and less tends to yellowness which retards the light and makes thin negatives but good printers.

With these three elements, water, pyro and carbonate, so responsive, the operator has under his control all that is necessary providing the exposure has been anywhere near correct. He may take several exposures of the same thing and by varying the developer produce a series of negatives that will give a variety of results and in this way learn just what are the possibilities.

Of course, some will object to the use of pyro because it oxidizes and stains. I find two drams of metabisulphite added to my pyro-metol combination is much better than the old way of using a small quantity of acid. The hands may be kept in good condition if care is used.

It is not alone with negative development that modification pays; it works very well with paper. Try the strong and the weak developers and see what results. The strong developer with short but sufficient exposure will give vigorous prints. The weak with longer exposure will give a softer and grayer result. Distance from source of light will have a big effect. Try one print at six inches from the gas or electric lamp and then try another at twelve or eighteen inches from the light, remembering the known rule regarding difference in exposure at varying distances. A little experimenting will demonstrate the value of breaking away from the old way of doing things. And when these things have been learned the worker will find opportunity for going farther afield in his quest of knowledge.



THE CONVALESCENT. H. M. LONG.



Figure 1.

INFANT AND NURSE.

Illustrating Article "The Photographer with an Artist's Temperament," by Sidney Allan.

THE PHOTOGRAPHER WITH AN ARTIST'S TEMPERAMENT

By SIDNEY ALLAN

THE illustrations accompanying this article are by Robert R. McGeorge (of Buffalo) and display a special talent for space composition. The very first scrutiny of his prints reveals that fact. Whether he gathered the knowledge from Arthur W. Dow's excellent book on that subject, or from color prints, or other Oriental curios, this no doubt he himself would not be able to answer. He realizes, however, that he possesses the peculiar gift of division, of balance of shapes and proportions, and of harmoniously placing a figure into any chosen picture area, elements which constitute one of the principal charms of Japanese art.

A composition as we see in his "Infant and Nurse" (Figure 1) was formerly considered if not impossible at least in bad taste and extravagant. There clings to it even now a flavor of oddity. The diagonal division from the upper right to the lower left corner is somewhat startling.

Mary Cassatt (the American paintress) has indulged frequently in this scheme in her color etchings of mother and child life. It is of Japanese origin; previous to the advent of Hokusai and Hiroshige prints, nobody would have dreamt of such apparently careless grouping which leaves one half of the pictures empty. McGeorge solved the problem in his picture. Although the form of the nurse and the chair may strike one as being somewhat clumsy and awkward, it could hardly be improved upon. The introduction of the toy in the upper left corner was a master stroke. The diagonal division (the direction of its line being straight and its length excessive) necessarily demands angular shapes and lines, as we notice in the apron, the chair and the general tendency of forms throughout the two figures. For this reason this scheme

of composition lends itself particularly well to seated figures and a realistic treatment.

The same feeling for space is noticeable in nearly all of McGeorge's pictures for instance, in the management of the frame in "The Critic" (Figure 2.)

Many may be his equal in the mastering of light and tone, few share his faculty for spacing. Most of his pictures are of odd sizes, this of course, is due to trimming, but he shows rare skill in the selection of that part of the picture which to his mind represents the most favorable version of the subject. The selection of the contour of the main figure (group or object of interest) with the lines of the margin is always in good taste. Study the lines and shapes in any of his pictures from this view point, and you will never discover any jarring or discordant note.

I believe that this gift is largely due to the fact that McGeorge was originally a painter, a designer of illustration and advertising picture (which he now carries on in the photographic field). He has the temperament of an artist. Biographically it may be interesting that he studied under Du Mond, Wm. M. Chase, and Kenyon Cox, the severe drawing master of the N. Y. Art Students' League. Although none of them is an expert of composition (in the sense of Gerome) they all see things with the artist's eye, which is an entirely different thing than the vision of the average photographer.

The shortcoming of most photographic practitioners is not only that they lack the skill of handling the tools of draughtsmanship and painting, but that they do not see enough of art exhibitions and publications, and that they do not venture forth into life and study nature and human society in its various aspects and pictorial phases. They fail to train their own eyes sufficiently, as they rely too much on their third additional eye, the lens, which is a mere recorder. The man with an artistic education starts with a tremendous advantage, and McGeorge is really one of the few photographers I have met who can paint.

Of course this knowledge also has its drawbacks. The photographer with his artist's temperament will scarcely ever become a perfect technician. He is too impatient and for that



Figure 2.

THE CRITIC.

Illustrating Article "The Photographer with an Artist's Temperament," by Sidney Allan.

reason will be at times careless and neglectful. And most assuredly he will be guilty of some inefficiencies from the business viewpoint. But the latter is neither here or there, as it is a faculty which has nothing to do with photography, either as an art or profession.

McGeorge is fond of experimenting. Face to face with a sitter he experiences the fever of the artist for pictorial investigation. To make an exposure is to him what a sketch is to a painter. He may carry it out in Ozotype enlargements, or he may not. Many technical details may be neglected, but never the composition.

Look at his "Gentleman Reading" (Figure 3.) how well the sitter's occupation is carried out in the expression of the face and hands, and how the tiny shadows of pure white of the collar, tie and vest produce a color note. His detail of line arrangement, although the latter scarcely aspires to the beauty of line for line's sake, is always good. It is wilful, accidental at times, but never obtrusive.

In his management of light McGeorge is quite eccentric. It is difficult to guess where it comes from. There are too many varied sources and reflections, but it has the merit of being soft and luminous. He is particularly fond of photographing "towards the light," which gives to some of his faces a vague shadowy, one may say impressionistic expression. Far from being masterpieces McGeorge's best prints are of unusual interest, particularly so if one studies them for certain rather exceptional qualities as I have tried to point out.



Figure 3.

GENTLEMAN READING.

Illustrating Article "The Photographer with an Artist's Temperament," by Sidney Allan.



NIGHT ON THE LAGOON. CHARLES W. DOUTT.

ONE DEVELOPER ONLY

By E. J. WALL, F.R.P.S.

IT would seem almost unnecessary to suggest another developer in the face of the numerous formulæ extant; but my purpose is rather towards simplification than multiplication. There are some workers who consider that the plate-maker is most likely to know what developer suits his productions best, but this is open to argument. It is obvious from examination of many commercial formulæ that they were devised when emulsion-making had not reached the high stage that it has now and very few of them seem to be based on photochemical investigations.



MOORLAND. J. M. Whitehead.

It has yet to be proved that one developer will do more than another; and, excluding ferrous oxalate, it is generally accepted that developers merely differ in their rate of action, and provided that you know this and determine the necessary time to obtain a given degree of contrast, that is, to obtain the class of negative you want, they can be used indiscriminately for all plates and papers.

It may seem a retrograde step to advise the use of one developer, and one only, for all work; but it certainly makes for simplicity and gives one constant factor, thus eliminating any question of the developer being to blame if results do not turn out as they should.

I have used the following for thirteen years and see no reason to abandon it though naturally I try any new agent that is introduced. Occasionally one reads of some wonderful new concoction, or combination of old ones, which is said to do everything under the sun, except make the plate and the exposure. This is, of course, only advertising, either for the stuff or the proposer, as some people delight in manufacturing new formulæ. Exactly how I acquired this particular combination I do not remember, but it has become my standard with which every other is compared:

Metol	3·5 g.	25 grains.
Sodium sulphite (anhyd)...	50 "	350 "
" carbonate " ...	37·5 "	260 "
Hydroquinone	5 "	36 "
Distilled water.....	1000 ccs.	16 fld. ozs.

Mix in the above order.

For negative work dilute the above with an equal quantity of water just before use. Time of development for portraits and indoor work 3½ minutes; for outdoor work 5 minutes. For papers add 1 part to 3 parts of water and one-eighth of a grain of potassium bromide to every ounce of the dilute developer. Standard temperature in all cases 65 deg. Fahr.

I have used this for every plate and paper on the American market with satisfactory results. It keeps well, does not stain and will only be found unsatisfactory by those who suffer from metol poisoning. I was curious to see how far it differed from that of the mean developer recommended by plate

and paper makers, and it is not far out, as shown by the following table:

	A	B	C	D
Metol	.781	1.01	.4	.675
Hydro.	1.128	1.31	.56	2.5
Sulphite	11.0	9.0	5.5	11.0
Carbonate	8.0	8.0	4.0	13.26
Bromide			.125	.26

Column A gives my developer in grains per ounce; B the means of the makers' formulæ for plates; C is my solution for gaslight papers, and D the mean of the maker's. A and B do not differ much, but there is a big difference between C and D, yet the former works well.

It will be noted that I have omitted the bromide in the negative developer, although plate makers advise it. It is quite unnecessary, as all plates now work clean without it and it only slows the plate, and in snapshot and portrait work this is a serious handicap.

I do not wish to imply that there is anything magical in this particular combination, or that it will enable any one to turn out pictures every time. Only I have found it satisfactory and it is adjustable, like every other developer, to all classes of work, when you know how to use it, and I know this thoroughly. Herein lies the secret of successful work—knowing your tools. A man who is constantly chopping and changing his plates, his developer and printing materials cannot possibly turn out good work always, for every time he has a factor that he is not perfectly familiar with and which wants learning—and plates, developers and papers all have their idiosyncrasies, which the successful worker must learn.



SUGGESTIONS FOR PHOTOGRAPHIC DECORATIVE PANELS.

ERNEST W. JACKSON.



REINDEER, WINTER IN NORWAY. H. M. LOMAS, F.R.G.S.

THE CINEMATOGRAPH AS A MEDIUM OF EDUCATION

By H. M. LOMAS, F.R.G.S.

IT is fairly safe to say that never has any form of amusement attained such world-wide popularity as has the Moving Picture Show. There are the magnificent theatres of great cities, and also lowly tumble-down shops converted at a small expenditure into "Shows", there are tents and marquees in the East Indies and strange buildings in China, where the moving picture is looked upon by the peoples of East and West; the pictures amuse the rich and idle and cheer the poor and weary. Like the art of printing, the moving picture has come to stay, for better or worse, as a blessing or a curse, and we cannot check its course, but it remains for those who use it to make of the thing a power for either good or evil.

Two dangers beset the educationalists. One is the danger of making education so light and easy, under the plea of making it "interesting" that it fails in its mission, owing to the fact that it can be attained without the strain of mental discipline and concentration. In other words, the pupil attaches



PORTRAIT OF MRS. S. The Earl of Carnarvon.



THE COAST OF ARABIA. H. M. LOMAS, F.R.G.S.

to himself a string of facts, but never learns to think. The other danger is in the reverse direction, that of making a subject so uninteresting and disconnected from all sense of pleasure, that the student turns from it as soon as possible in disgust.

The use of the cinematograph for educational work shares these dangers, and to be successful needs the true balance kept between the extreme, but as it has a great hold on the people of all lands it offers a great chance for slowly, but surely, making them interested in things around them—in Nature, Art and History, in Crafts and Industries, or the doings of other Nations—and thus stimulating their desire for knowledge in the widest sense of the term.

It is interesting to remember that this great pleasure-art was originally looked on as an aid to science, that Muybridge and Marey probably saw no "popular entertainment" in embryo in their methods of securing consecutive series of bird and animal photographs, but only a means of furthering study; but soon the time came when the scientific possibilities of the moving picture were far less considered by those who used it than its entertaining capacity, and it became for the most part a showman's affair. Nevertheless, even in its most blood-curdling days it was truly a power for education, and the cowboy tragedies which now pall on us doubtless presented a vision of a freer more unfettered life with nature to the minds of many sordid and weary town-bred urchins.

To treat the matter in a more technical manner, how can geography be better taught than by actual moving pictures of distant lands that bring vividly before the student the manners and customs of the inhabitants and show the state of civilization to which they have attained as signified by their domestic, agricultural and other implements—whether for instance they have attained to the use of wheeled carts—also their use of animals as companions or aids to hunting for food and on the land for ploughing &c, or bred for their flesh? The pictures if rightly chosen will also show the religious and social customs of the people, their implements and possibly their methods of warfare, and the type of country in which they live. To secure such pictures it is necessary that the photographer be a man of education and tact, no mere handle turning appendage to a cinematograph camera, and this and other educational moving picture work forms a field as yet little trodden, and an opening of a new form of career and profession to those who are lovers of travel and photography, but have not the means to indulge in their hobby as amateurs with no remuneration for their labors. To put it at its lowest, there is money in it, and better than that it gives scope for the use of many talents to those who may have been puzzled to know what to do. It is easy for one skilled in photography to master the technical side of the new work, and the knowledge he already has will be invaluable and give him the pull over the man with no previous photographic knowledge. The writer can vouch for the fact that it is interesting work and

full of adventures great and small, humorous and tragic, and if taken up in earnest not only will shipping companies and railways grant assistance, but governments will lend a helping hand, enabling one to get to those regions where the tourist never travels and where work of world wide value may be done.

I am a wanderer so talk about the possibilities of travel work, but it is only a small part of the great field just opening before the photographer with a cinematograph camera. Biology and the microscope, surgery, natural history—in fact all the sciences and the hobbies of men—can be exploited and will give not only great pleasure to the photographer himself, but his results may be of the greatest use in educating others and stimulating in them the desire for knowledge.



A CANAL BARGE, HOLLAND. H. M. LOMAS, F.R.G.S.

INTERIOR GROUPING

By J. ELLSWORTH GROSS

IN portraits we know that the head must always hold the prime place, and we have to give a representation in positive form of an impression which shall convey to others, the individuality of the person sitting.

Now and then a photographer has some especial problem. In this case the honor was mine to photograph (Figure 1) the judges of the Supreme Court of Illinois, singly and sitting at the bench.

Seven superb men, with as many strong and intellectual faces, and all to hold a prime place in the picture, also to depict the individuality of each one of them.

The expressions of faces change in a moment. To catch all at the right and characteristic instant is the study of the portraitist.

To personally know a subject, or to read his biography we learn much of the personality, so that we almost see him working and thinking; to this we must add the graphic representation of form and figure, and in doing so not conceal the inspiration of each soul.

Every face has the same parts, yet they vary enough in their relation, each with the other, that we recognise in each one a distinct face; and there is also the self to portray. In doing this we either succeed or we fail.

In a group we must remember, that each face is round, that its outline is soft and the flesh is to be represented by light and shade.

We often have new backgrounds to deal with, and all the accessories are strange, but we must quickly arrange the face lights, before some one of the group becomes weary and before the portraitist loses his chance to reveal the best of each one.



Figure 1.

THE JUDGES OF THE SUPREME COURT OF ILLINOIS.

Illustrating Article "Interior Grouping," by J. Ellsworth Gross.

Without the element of revelation there will be lacking, the something, which gives to the picture life, life to each eye, and warmth and life to the flesh.

In the case of the judges, they might as well been handcuffed, as far as having hands to deal with; and they must sit apart so they could not be grouped.

An equal amount of light and shade for the face will not do; it must be an unknown proportion, with full exposure, as short exposures will not do justice to each sitter. Each face is a study in lighting to bring out the modelling.

To gather this group of individuals into one splendid whole is a great triumph; a joy to have accomplished many portraits into one picture and in this case, a picture that is acceptable, as this is, to hang in the Supreme Court House, of the capitol of Illinois; also in the homes of these judges, and in many homes of their friends.

Sunlight can be used with proper care. The shadows must be transparent. If the light is so strong that the flesh tint of the face is hidden, it must be softened. The "Mender of Toys" (Figure 2) and the children are the result of various improvised accessories for interior work, with the exposure of shorter duration for the children.



PANSIES. BESSIE W. THOMAS.



FROM AN OIL PRINT. Rudolf Dührkoop.



Figure 2.

THE MENDER OF TOYS.

Illustrating Article "Interior Grouping," by J. Ellsworth Gross.

PHOTO COMPOSITION FROM THE ART SCHOOL STANDPOINT

By WILLIAM S. RICE

IT has been the experience of the writer that as an instrument for developing the keen perception and appreciation of beauty, and for the study of pictorial composition with art school principles, the camera is without a rival.

During the early stages of every amateur photographer's career there is much popping away at everything within range, merely for the novelty of "pressing the button." But there comes a time later—an awakening when the aesthetic sense is aroused—providing it has lain dormant in one's makeup, and he is seized with an irresistible desire to reproduce beautiful instead of grotesque or commonplace things.

"Unfortunately for the beginner desire and enthusiasm avail little unless yoked with knowledge. However gifted he may be temperamentally the novice must learn something of the laws of composition—balance, symmetry, light and dark, or as the Japanese call it, 'Notan,' ere he can produce a really beautiful picture."

The dictionary describes the meaning of the word composition as "that combination of several parts in which each is presented in its due proportion." The difficulty in the case of the tyro is: first, to determine what constitutes due proportion of each part, and second, to discover some means of eliminating undesirable or superfluous features. The latter is easier for the painter than for the camera man, as with one sweep of the brush he can wipe out a mountain, or re-tint the sunset, or dodge some aggressive bill-board or telegraph pole. Not so with the camera. It has a far more limited power to eliminate or augment. It can only reproduce with mechanical exactness whatever is presented to its glassy eye.

The resulting wealth of detail is one of the big bears of the art photographer who has recourse to blurring, rough-surfaced papers, the retoucher's pencil, and other devices in order to



THE ANCHORAGE.

Illustrating Article "Photo Composition from the Art School Standpoint," by Wiliam S. Rice.

destroy, or subdue all but the essential features. The essential features which are a synonym for simplicity should be the keynote for the student of photography who aspires to compose with his camera pictures based on the laws of art school composition. Select a central theme for your picture, and let all else be subordinate to it.

Let me point out a little experience of an art student as a case of what not to do. A young artist went forth one day, so the story was told me, to paint haystacks in a green meadow. During the day a number of creatures passed within view, all of whom she embodied in her composition. By nightfall she had immortalized on a 17 x 22-inch canvas three farmhands, one crow, two children, one stray cow, one pair of horses, one puppy, one rooster, and four hens. When completed the sketch suggested a zoological garden rather than a hay-field in July. And it was all because she allowed her mind to stray from the central theme and forget the importance of simplicity.

After the choice of a subject the next step is to decide how it should be placed upon the given area. Above all avoid putting it squarely in the center, but let it come somewhere near either above or below, or a little to the right or left of the center. Do this to avoid monotony of spacing. Considering the picture merely as a rectangular space to be filled we may begin by so arranging the principal lines (as for example, the horizon, the water-line, baseboard of a room, trunks of trees or folds of drapery) as to break up the original space into smaller ones of varying proportions. So far as possible let the general trend of the less important lines be toward the center of interest which must not be confounded with the center of the picture.

The leading lines of the picture having been planned by means of the finder, or focusing screen, it is an excellent plan to take a lead pencil and space off both the finder and the ground glass focusing screen into vertical and horizontal center lines. By having these lines for reference you can tell better how to avoid placing the central theme of interest upon them. The distribution of the lights and darks must be considered. The deepest as well as the lightest tones or "values" as artists term them, should be concentrated. Small patches of intense light



GRAY DAY ON THE DUNES.

Illustrating Article "Photo Composition from the Art School Standpoint," by William S. Rice.

or dark scattered through the picture tend to destroy contrast and produce a confused effect.

The use of two L shaped pieces of heavy paper or cardboard are likewise of great value to the student of composition, as very often a print may be improved by trimming away superfluous parts. Adjust these L's or "finders" in this manner ⊣⊢ and shift them about until the placing of your print fulfills the laws that govern balance, symmetry, line and "Notan," if you have not succeeded in perfecting your composition on the original plate.

In the two examples accompanying this article I have endeavored to embody the principles mentioned in the foregoing paper. How well I have succeeded in this will be a matter for your own consideration. These prints have not been retouched or modified in any way, and are "straight" compositions. Of course, in painting, or sketching some of these subjects, the artist would be tempted to eliminate a bit here and there, perhaps, to get the picture entirely satisfactory.



IN MY STUDIO. E. G. DUNNING.



CRONIES.

Copyright, 1913, by Belle Johnson.



Figure 1.
Illustrating Article "Character and Individuality in Portraiture," by Arthur Hammond.

CHARACTER AND INDIVIDUALITY IN PORTRAITURE

By ARTHUR HAMMOND

THE fascination of portraiture lies, undoubtedly, in the fact that in addition to the photographic problems that are encountered, one is brought into touch with the study of human nature. Photographic technique is but the grammar of the art of portraiture, and is the least of the difficulties to be overcome in the production of really successful portraits. Just as a writer must learn to spell and must be familiar with the rules of grammar before he can consider the composition and style of his writings, so the portrait photographer must understand the problems of lighting, exposure and develop-



Figure 2.

Illustrating Article "Character and Individuality in Portraiture," by Arthur Hammond.

ment before he can make much progress in the rendition of character and personality. The elementary technical difficulties of portraiture are explained very thoroughly and explicitly in the many magazines and handbooks devoted to the subject, and it is with the higher problems of portraiture I propose to deal in these notes.

First of all, why should one portrait of a certain person be better than another? What is it that distinguishes a good portrait from a bad one? Both may be technically faultless, both may be good prints from technically perfect negatives, yet it often happens that one is approved and others are ruthlessly condemned. There must be something beyond mere technical perfection, there must be some indication of the personality of the sitter. We must have more in the picture than a map of the features; we must try and get into it some of the individuality and personality, some distinguishing characteristic that will make the picture a speaking likeness of that particular person. The poise of the head, the attitude and expression all play a part in the indication of personality. If you meet a relative, or an intimate friend, you can tell who it is by the general carriage of the figure even before you approach closely enough to distinguish the features, and if you see someone you know very well in a dim light, you can tell who it is by the attitude even if the face is turned away from you. There can be a lot of individuality and likeness in a back view; a picture can be a good portrait even if the face is not shown at all.. Figure 1 well illustrates this point. In this little snapshot the boy's face is almost entirely hidden by his hat, yet it is a good likeness and is readily recognized by anyone acquainted with the child.

It is just such natural characteristics as these we must try and emphasize, in addition to the face, if we want a good likeness and in this respect the photographer must exercise tact and patience in addition to technical skill.

A good deal depends upon the sitter; some are more difficult to deal with than others, but, to my mind, there is more credit and more satisfaction in securing a successful picture of a difficult subject than in making a good portrait of an easy one. Children, and I think more especially boys, as a rule are less self-conscious than grown people and, there-



Figure 3.

Illustrating Article "Character and Individuality in Portraiture," by Arthur Hammond.

fore, a natural attitude and expression can be obtained more easily and quickly, but even children often are difficult subjects.

With regard to posing, the best advice I can give is—don't pose the sitter at all; just watch and wait for a characteristic attitude and then try to portray that from the best aspect and point of view. Sometimes an attitude may be characteristic but not picturesque, and, therefore, some discrimination must be exercised in the selection.

Dealing, as he does, with more or less intimate friends, the amateur portraitist has a tremendous advantage over the professional, and the easy and unconstrained intercourse is a great help towards the production of good portraits. That is why a chance snapshot often is a far better likeness in spite of technical shortcomings than the elaborately posed picture from a professional studio; the snapshot has character and individuality that the other lacks.

Every effort should be made to have the sitter quite at ease and as little conscious of the camera as possible. My own method is to try and induce naturalness by means of conversation on a subject that I know is of interest to my sitter. I discuss base-ball with the boys and watch carefully all the time for an attitude and expression that I think is characteristic. Then, by rapid work, I endeavor to secure this before it goes. I often get the picture all focussed and the plate ready for exposure and then wait till I get an expression I like. Sometimes it is possible to take the picture without telling the sitter, if not, a brisk remark, such as—"keep quite still, just as you are", will nearly always secure the requisite repose, provided the exposure can be made right away without any delay. Complete absence of camera-consciousness is absolutely essential and it can be secured only by diverting the mind of the sitter into other channels. Sometimes rather drastic methods are necessary in order to make the sitter forget for an instant that he is having his picture taken. I once had a difficult task in taking some pictures of a young man, a stranger to me, who was trying very hard to "look pleasant." I tried the conversation method without much success till, suddenly, *apropos* of nothing, I said to him—"What did you have for breakfast this morning?" His surprise at my foolish



Figure 4.

Illustrating Article "Character and Individuality in Portraiture," by Arthur Hammond.

question made him, for an instant, forget himself and in that instant I made a successful exposure.

Look at Figure 2, notice the attitude and the poise of the head. This is obviously natural and characteristic. It would have been quite impossible for me, or anyone else, deliberately to have arranged the boy's head in this manner without the attitude being forced and strained. The attitude and expression show the type. So it is also in Figures 3 and 4, the manner of holding the head, well up and back in Figure 3 and leaning forward in Figure 4, is absolutely natural.

In these three pictures that show only the head and shoulders, the pose and poise of the head is distinctly characteristic, but when the hands and arms are shown in the picture the possibilities of showing character are much increased.

In the group picture, Figure 5, the younger boy's hands may not be particularly graceful, but certainly they are very natural.

Rapid work often is necessary in portrait making. Absolute familiarity with the manipulation of the camera and an instinctive appreciation of the best point of view should be cultivated. Another desirable attribute is the ability to make the necessary adjustments of the camera as unobtrusively as possible; do everything deliberately and carefully, but try to avoid attracting too much attention to the camera. Tact and patience and the ability to adapt one's methods to suit the particular case in point are desirable qualifications. Every sitter is different and needs different treatment and one has to get through the mask of shyness or self-consciousness before the real man, woman or child can be depicted. A photographer often is compelled to discover as much in a few moments as regards the true personality of his sitter as a painter would in a week, and it is just on this account that it is easier to make good pictures of one's friends. A well known lady photographer in London will not attempt to make portraits of persons she is not acquainted with until she has had an opportunity to study them for at least an hour or more. Her sittings often are preceded by "afternoon tea" and the results fully justify her methods.

This is the reason why, in my own work, I have specialized to a great extent in the portraiture of the human boy. Boys interest me and I can get acquainted with them more quickly



Figure 5.

Illustrating Article "Character and Individuality in Portraiture," by Arthur Hammond.

than with other people. By specializing in such a way, better results often can be obtained. E. B. Core of New York is a lover of children and likes to make pictures of them. He therefore, very wisely, makes a specialty of this branch of the work. Similarly, Pirie McDonald has an international reputation as a photographer of men.

Portraiture is a branch of photography that is easy up to a certain point; the technical part of the work can be mastered by anyone after a little experience and the problems of lighting can be reduced to a few simple rules, but beyond that the worker must rely upon his own natural aptitude for it is just this natural aptitude and the ability to infuse character into the pictures that raises good portraits out of the rut; that makes them worthy of a place in an exhibition, and enables some of the well known professionals to command a high price for their work.



A PASTURE BROOK. FRANK LAING.



A YOUNG ARTIST. Louis Fleckenstein.



A SPRING EFFECT—SILVER BIRCH AND DAFFODILS.
Copyright, by E. J. Wallis.

GUM BICHROMATE MANIPULATIONS

By CHARLES E. FAIRMAN

WHOEVER supposes that the last word has been written, or that all of the information concerning this fascinating photographic process has been published, has but an imperfect knowledge of the many sided possibilities of this little practiced branch of photographic printing, and for the purpose of supplementing what has before been written upon this subject by "bi-gum" workers is the object of this brief article.

The impression is quite common that in order to be a successful gum printer, one must in the development of the exposed paper, be not only as light fingered and skillful in the use of a brush as a painter of miniatures, and have at their fingers end the profound knowledge of the artist with many years of experience. Such deftness is valuable, as is also the trained hand of the artist, but I am writing for those who belong to the ranks, and who may never have the opportunity

to avail themselves of the training acquired either in art schools or by years of hard work.

As a preliminary statement, I will say that in all of my experience in photographic experiments, I have never found a process more purely mechanical than the gum-bichromate process carried along certain lines and to a certain distance. To illustrate, I wish to state that I know of no other process where a piece of printing paper may be exposed under a negative, and when *properly exposed* may be placed in a tray of clean water, face down, and left to develop automatically. This is possible with the gum process and if all the preliminary steps have been properly taken, such as paper coated just right, the exposure correctly timed, it will be found that a very good print can be obtained by automatic development.

Too much emphasis cannot be placed upon a proper coating of the paper, the proportions of the gum coating must be well arranged, and the paper not only coated smoothly, but as thinly as possible. In the selection of pigment, the colors sold in water color tubes seem to give the best satisfaction, although there are some colors such as red chalk, which I have been unable to find in tube colors with sufficient body to give anything but a weak and unsatisfactory print. I have found a dry pigment known as Old English Red which gives excellent results when red chalk tones are desired, and I have seen nothing in gum work which has given a better red chalk impression.

Fearing that this article may exceed an "available" length I want to impress upon the would-be gum workers the possibilities of very artistic results from working with a very freshly coated paper. I mean by this a paper which has been coated within two or three hours of the time of printing. This is especially true if you wish to develop automatically, but it should be remembered that the exposure will have to be perhaps a half longer with fresh paper than it would be with paper that had been coated for twelve hours before printing. The particular advantage of this freshly coated paper is a tendency to what I shall call the "drift" of the photographic image, resulting in a slightly blurred outline, and thereby depriving the print of the hardness often found in photography. Perhaps you may say that you do not desire blurred outlines



GRASSHOPPER WARBLER FEEDING YOUNG. WILLIAM FARREN.

even in a slight degree, that you wish your results to be definite statements of realism, and if this is the case, all that is necessary is to have your paper very thoroughly dried, your negatives harsh and crisp, and your results will be as severe as an avenging angel, but not half as attractive.

Many secure the blurred outline by repeated printings, and this no doubt has its advantage, otherwise so many would not practice it; but if the same result can be obtained with one printing, and a quality with some slight resemblance to a wash drawing be obtained, the question may be asked, "is not the easiest way the best?"

If any wish to know my opinion as to the best negatives for gum printing I will say that it has been my experience that negatives which have been fully exposed, and fully developed with a developer containing less than a normal quantity of the reducing agent, seem to be best adapted to gum printing. I have never been an advocate for "strong" negatives for any kind of work. My choice is the negative with delicate gradations and just enough density so that high lights are not muddy and shadows transparent and well modulated. Such negatives yield fine gum prints.

It has been my experience that with fully dried paper the gum print requires the same exposure as a carbon print. If you have a print meter for carbon printing you may safely use it for gum printing.

This much has been written about the purely mechanical manipulation of gum-bichromate paper, but for those who prefer to experiment further, it should be remembered that there are as many different methods of developing gum paper as there are individual experimenters. Some have been known to overprint and then develop with warm water, using a spray from a fine bulb syringe for the denser portions, oftentimes scrubbing with delicate or harder brushes as the case may require to secure the desired detail. Others place the print on a plate of glass and develop by pouring the water from a cup or other container over the print. Nearly every plan known to human ingenuity to remove the surplus coating has been tried, but for me I prefer the deep tray of water and let the print develop naturally and without mechanical assistance.

A suggestion to the inexperienced worker may be of value. One of the properties of the gum-print in common with that of the carbon print is that it is more successfully treated in a dry than in a humid atmosphere. I may also say in closing that there is probably no other branch of printing which requires such a large stock of plain patience and dogged perseverance as does this process of which I am writing, and the person who tells you that he never has made any mistakes in gum work, and that he made fine prints at the first trial, is a person who has been given a greater degree of success than falls to the lot of most experimenters in this difficult process.



SIMPLICITY.

—*Copyright*, 1911, *by Knaffl & Bro.*

SYSTEM—PRACTICALLY APPLIED

By RICHARD TROTTER JEFFCOTT

IN conversation with a "Business Doctor" some months ago, he volunteered the information that in two lines of business—photography and plumbing—he noticed a lack of system in bookkeeping and the incidental methods connecting costs and production.

This statement I know to be true in regard to photographers, for many plants and studios are operated without a true sense and understanding of the question.

His visit was made at my solicitation, having in view at that time an improvement, if possible, over the system in use in my plant.

He had at his command facts and figures to prove that the "system" he advocated was in every way practical and easy of manipulation, and further rendered at a glance in comprehensive order figures showing the desired knowledge. Boiled down to a question of dollars and cents as to outlay and upkeep, his "system" was costly and theoretical and it required the services of more than one clerk, also the special forms and blanks to keep the "system" in working order were at least one hundred per cent higher than a first class printer would charge.

When I say that his "system" as outlined was "theoretical" I say so advisedly, for if he possessed an intimate knowledge of each line of business he undoubtedly would change his methods and ideas as he progressed in his work. The photographic business requires a "system" based first on practical experience and then a careful study and "tryout" of the proposed "system" in its application to the particular branch or specialty followed by the one about to adopt "something" that only time and experience will prove to be "right" in the end.

First one wants to know what are his "overhead charges," then his fixed charges as applied to "Expense." How much are his personal services worth, and does his wages account show a return in the work delivered? Do the prices he receives for his work enable him to deduct a fair percentage for loss of time and material, and does he buy his "mdse" in such quantities and at such times as to be in on the "ground floor"?

He wants to know that each and every employee is fully earning his wages and doing the work allotted to him in a reasonable time, and with a small percentage of loss in material. All these questions must bear answer before he is sure that his business and the consequent investment is paying him a good living and a fair return.

Further, the order system must be so simple and accurate that it is easily understood by all and can be intelligently followed. He should know that the "jobs" are properly "registered" and follow in subsequent order each progressive step in the "work" as it is reached.

Then again have the "best" method to be applied to the charging and account work in connection with each order, and finally the storing of all "forms" or "order slips" in good shape for easy reference at any time.

My further interviews with others whose business it was to sell "systems" and "forms" led me to believe that the particular method I had worked out and boiled down to almost a science was making good in every way and required a minimum of time and labor to render net results at a glance.

In my search for ideas to make my "system" "workable" I studied any number of catalogues and booklets in the evenings, tabulated various ideas and facts and then from time to time reviewed the same in its application to my needs, bearing in mind that the usual or unusual expanse of the business would not alter the basis of the whole.

I did not let cost interfere with the question of obtaining the best material, for my one idea was to get at facts and to dispense with old style methods, accomplishing in the end the bookkeeping—often tiresome and featureless—in about one-quarter of the time formerly required. My first move was to dispense with the day book or journal, also the cash

book. The forms and features required to take the place of the above are later explained.

Figure one (1) shows the order blank (in duplicate) used when each order is received—being the original entry—the basis of all method that follow, until the order is completed and charged. Special attention need not be directed, as it is self explanatory, with possibly a word or two in connection with the row of figures.

These figures made with a rubber stamp indicate the days of a working week Monday (1), Saturday (6). In connection with order No. 8952, received May 5, 1913, and promised on the 7th hence the circle around (3).

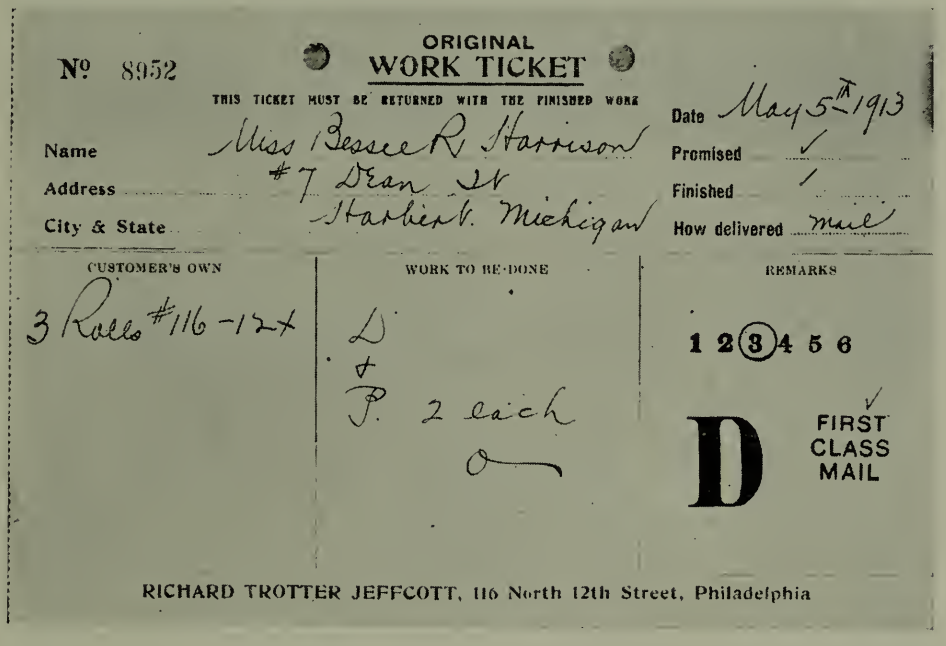


Figure 1.

You will notice that the "promise" made to the customer is not written, but in "code" understood by all who handle it that the order must be ready for delivery on (3) Wednesday. On this same order form will be noted two other "characters" placed here only that their use may be noted, but one only applying to this particular order.

On completion of the order it is to be forwarded to the customer as "first class mail" matter. In the event that it was "local," and required delivery, it would be stamped with the letter D.



Figure 3.

The original order slip No. 8952 is placed on the file, and the "duplicate" together with the roll films are placed in a work bag bearing a similar number. See figure No. 2. All being placed in Drawer "O" in the order stand—see figure No. 3. This stand we built ourselves of lumber with metal bins, the original expense has repaid itself many times; as to convenience and simplicity of system it requires but little mention.

The metal bins or trays from "1" to "6"—each 9″ x 5″ x 24″ hold from 100 to 300 orders in subsequent order. Bins "7" and "8" are sub-divided one for copies and the other for enlargements. All work is first placed in the back compartment and as the work progresses brought forward, suggestive of the last process in finishing. Number "9" bin is used for photographs, engravings and drawings held previous to being framed.

So as to gain room and find convenient space for other material the bins are 26 inches from the floor and the under space utilized for films and plates to be developed in "O" under which is a 24 inch trimmer mounted on trucks which can be brought forward for occasional use. Drawer No. 10

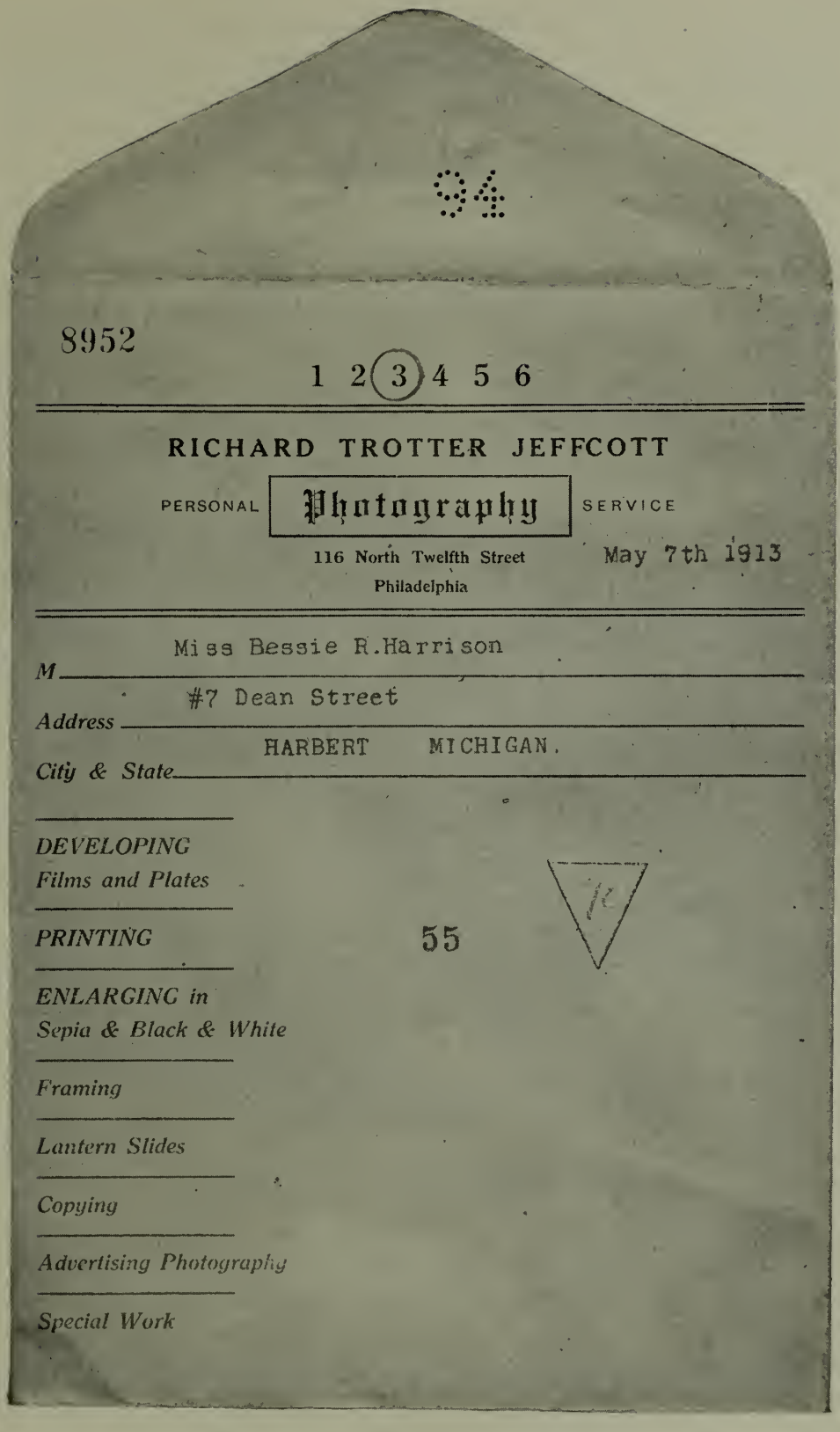


Figure 2.
Illustrating Article "System," by Richard Trotter Jeffcott.

holds used "forms" of the system filed in rotation in binders. The balance of the space holds mounting cards and ferro plates for glacé finishing. From Drawer "O" the Dark Room operator will from time to time during the day remove the films and plates to be developed. In the event that order No. 8952 was for printing only it would be placed immediately in Bin No. 3. As the printing room is usually ahead or up to the day's work, this system of handling "works" well. Reference is again asked to figure 2 the work envelope shows two "codes" not heretofore explained. On the flap of the envelop is a "94" punched with a cancelling machine (dark room) code and on the envelope, below the "address," is "55," the printing room code, made by a numbering machine.

For various reasons the Dark Room and Printing Dept. do not use or pay attention to the original order number, each using their own "code" for the proper identification of the "work" in process.

The Dark room uses a cancelling machine for roll films, first punching the flap of the envelop then the end of each film it contains be it 1 or 50 rolls. Simply verifying the contents with the order slip. This system has proven effective in every respect errors being avoided that may occur in following the original order number in this case four figures, and again the width of some films like V. P. K. and Brownies do not permit it. Each day's work starts with "O" and up to the total number of orders handled during that day, omitting confusing numbers as 6-9-66-99. On completion of the day's work the order envelopes are returned to a receiving box marked "A" on figure No. 3. On the following morning all films are sorted to their proper envelopes, contents verified and cut apart making ready for the printing room being "cased" in proper bin from "line code." The printer in sorting his work uses a numbering machine to designate the "code" of each job in this case "55" first sorting envelopes so that specials as to "hour time" have first attention. This machine is set at "O" and runs to 99 only, as higher numbers tend to confuse. All prints are numbered on the back to conform with "code." Orders being divided in lots of five at one time and given to each printer, who on completion of a "batch" returns the order bags to the finishing order desk, previously

Daily Report

919 DATE 5/7/13

Name John B. Smith

Total time	Printing	Developing	Enlarging
9 1/4	✓	✓	✓
Cabinet No.	**Chemicals**	**Finishing**	**Other Duties**
4.	✓	✓	

◁ This space to be used for data only ▷

Prints made	
0 & 1	70
2 Br.	180
1 A.	140
2 B.E.	15
3	108
4	6
3 A.	72
4 A.	10
5	✓
6	✓
8	20
11	✓
Pan	
P.C.	200
Total	821

Developing

Roll Films	Plates	Film Packs
Brownie 71	8 - 8/10	2 - 3 4/5 ✓
	20 - 5/7	4 - #3
Others 109	7 - 4/5	1 - #4

Finishing Completed

75 Jobs ✓

Enlargements

9 - 8/10 B-W

Chemicals Prepared

3 Jugs D.R ✓
5 D.R

This report must be sent to the office daily

REMARKS:-

Order Sulphite Soda
Repair washing Box (5×7)
Spoiled 7 - 4/6 1 - 8/10 12 P/C ✓

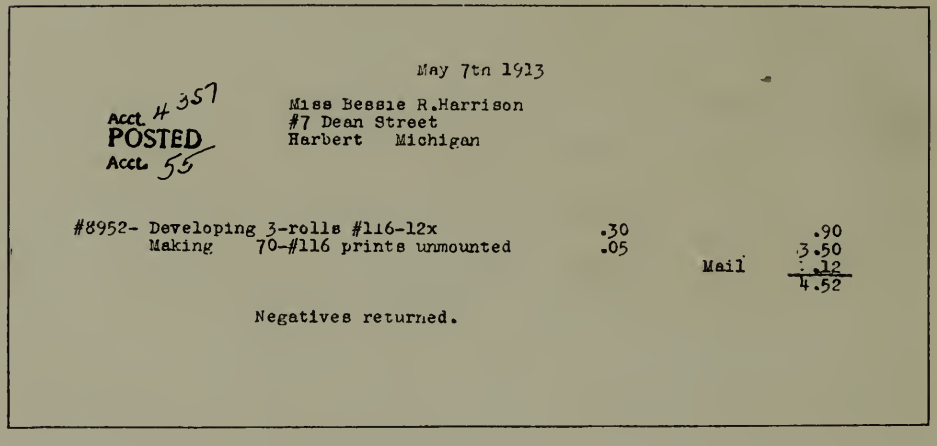
Figure 4.

Illustrating Article "System," by Richard Trotter Jeffcott.

placing on the envelope his "working code" as in this case, seventy signifying that the job contains 70 prints and in case of "do overs," stained or torn prints the order must be returned to him for correction.

When completed as to washing, drying, cleaning, pressing, trimming and sorting the order slip is checked back, "O.K." dated and placed in a "billing basket" ready for charging, as will be further explained. Also the system of handling and filing.

Attention is now directed to figure No. 4, known as "Daily Report Slip," which renders in detail the amount of work


May 7th 1913

Acct # 357
POSTED
Acct. 55

Miss Bessie R.Harrison
#7 Dean Street
Harbert Michigan

#8952- Developing 3-rolls #116-12x		.30		.90
Making 70-#116 prints unmounted		.05		3.50
	Mail			.12
				4.52

Negatives returned.

Figure 5.

each operator has completed. So as to readily explain its use and not confuse the reader, this sample report covers the Dark room, Printing Dept., Bromide room, Chemical room and Finisher, where as a matter of fact each operator turns in an individual daily report slip rendering an account of all work he has completed.

In the "Remarks" space additional information as to the number of prints spoiled (from all sources) need of any particular article, chemicals to be ordered or repairs required, is generally noted. It will be noticed that this method of keeping "tabs" on the working Depts. render at all times an accurate knowledge as to the amount of work produced and the addition of each report slip gives the day's gross output.

We will now return to the bookkeeping of such a system showing where possible the necessary forms used and ex-



Figure 6.

plaining in detail each step that obtains in a manner to reduce the work in various ways to the least amount of labor and in the end render an accurate accounting.

From the "billing basket" we take the duplicate order slip, now showing the necessary data thereon, and also the original order slip from the file all ready for billing. Using a bill head and "bond paper duplicate" of uniform size with the order slips, the "charge" is made as in figure 5, ready for the "Daily file" previous to posting.

On the left hand side a rubber stamp imprints Acct. POSTED Acct. before filing under "7" (May 7th) in the Macy Desk file (shown to the left on the desk bed in Figure 6) together with all orders, purchases, invoices and credits, etc., as came to

hand May 7th, 1913. These papers may be handled at any leisure moment and posted direct to the 5 x 8 ledger cards. (Figure 7.) It must be remembered that all papers as above described are used as originals (without day book or Journal writing) and only bearing in addition the posting imprint as above noted.

Reference to Figure 6 shows the desk equipped (on top) with the bookkeeping system. On the right hand side is the cabinet containing 2-5 x 8 Y & E. Trays holding in the lower section "Open Accounts" arranged in A B C order of 40 divisions, also under a 25 division, "accounts payable" and

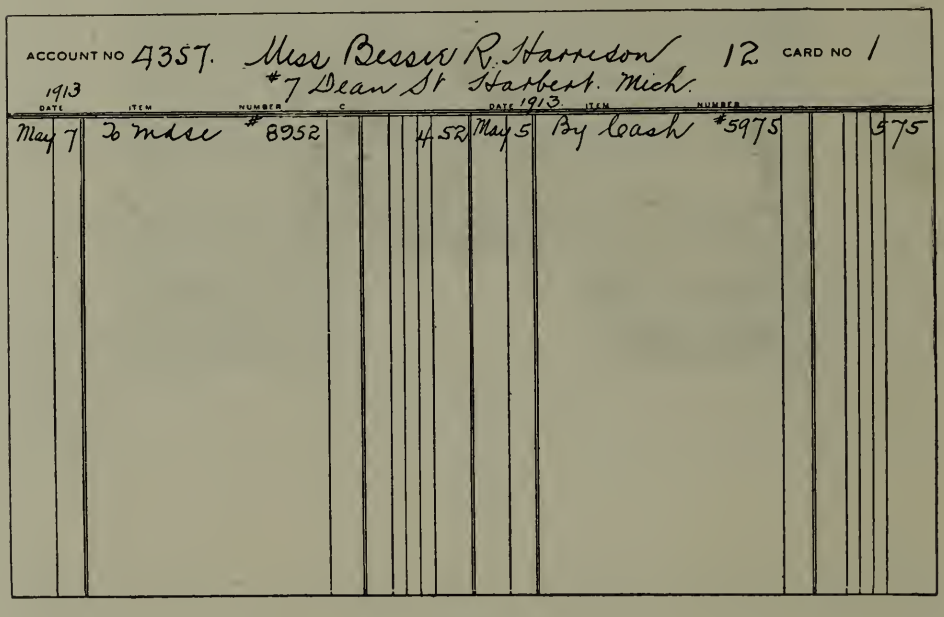


Figure 7.

"private." Accounts in the upper Tray are filed in 25 Divisions under "Closed Accounts." The next cabinet contains forms and slips for handy use, next the daily letter basket and lastly a Division file for receipts, cancelled checks, and monthly reports.

These cabinets and trays were purchased in the "white" and stained and finished to harmonize with the office fittings —mission oak. We will return to the bookkeeping in connection with the various items explaining first the division of accounts.

All accounts "payable" as Rent, E & G. acct, Expense, Improvement, Wages, Drawing Acct., Insurance, D and I Acct.,



RICHARD TROTTER JEFFCOTT.

CLINT SHAFER.

Cash, Merchandise and Ret'd Mdse. Acct. are numbered under 200.

All others (firm and individual accounts) are numbered from 201 forward, and a number once given and registered is never changed at any time whether the account may be "open," "closed" or "storage." For these three features govern the proper location of each ledger card at any time, as "O," "C," "S." The "charge" (No. 8952) we have now ready for posting (see figure 7) is a new account which was accompanied with a money order for $5.75. Acknowledgement of the same was promptly made and entered in the "petty cash book," it being previously stated that I do not use a cash book but "Daily Cash Statements," which give at a glance an accurate condition of resources see figure 8.

In sorting the various papers in connection with the business of May 7th, 1913, we take the charges first and among them find order No. 8952 ready for posting. Ascertaining that this customer does not have an account number (I give all accounts a ledger card irrespective of the amount of sale, or whether charge, cash or C. O. D.) and find the next consecutive account number is No. 4357. This number is placed in the space after "account number" the name and address follows.

Miss Bessie R. Harrison,
No. 7 Dean St.,
Harbert, Michigan.

in the empty space after the name "12" is placed signifiying that "Ha" files in space "12" for simplicity and accuracy in filing, and that the card for this account is No. 1. On the "Debit" side it is charged May 7th, 1913. To Mdse. No. 8952—$4.52 reference in the charge being made to the order number.

It may be that at a later period we may desire to refer to this customer's account and look up some detail in connection. Reference to the Ledger Account refers to No. 4357. In the finished order file cabinet will be found (No. 4300) binder and in its proper place No. 4357 order showing duplicate charge slip together with the duplicate and original order slips, so that the required data may be readily obtained. On the "Credit" side of our ledger account No. 4357 we find

DAILY CASH STATEMENT

RICHARD TROTTER JEFFCOTT

PERSONAL **Photography** SERVICE

5975

116 North Twelfth Street

Date May 5th 1913

Posted to Account Number	C		Dr.		Cr.	
		Cash on hand			X	XX
4357	5	Bessie R Harrison			5	75
271	5	Smith + Harper			71	68
785	5	J M. Jones			1	35
981	5	E. R. Elling			5	07
4275	5	Henderson Mfg Co			13	83
25	5	Express In 1.05 out .75	1	80		
25	5	paper + twine #1842	2	65		
25	5	postage		75		
35	5	lumber + nails	8	33		
55	5	Eijko paper #1814	65	73		
75	5	Johnson + Stiles 9%	13	68		

Figure 8.

Illustrating Article "System," by Richard Trotter Jeffcott.

under date of May 5th, 1913. By Cash No. 5975, $5.75. If you will examine figure 8 it will be found that the "Daily Cash Statement" for that date was No. 5975, so that reference to the ledger account shows how the cash item is disposed of. In the preparation of the "Daily Cash Statements" for a month's use previous to dating the same in numerical order and placing in a "Grip Binder" you will omit all holidays and Sundays, reducing the working days to 25 or 26 as the case may be.

From the previous month's "Cash on hand" is forwarded and as each day's entries are made (transferred from a petty cash book) they are placed in the proper Dr. or Cr. columns. So as to verify the P. C. B. original entries it is well to compare the same and check each entry, placing under the last entry the number of the D. C. S. to which it has been transferred.

From the D. C. S. all items must first be posted to the Cash Acct. Ledger card as shown to the left and posted as "5." Next each entry must be posted to its proper acct, as in "Harrison No. 4357," showing proper credit has been made. The balance may be returned or left to her credit as desired. As a matter of reference to Figure 8 I will offer as a guide to the proper placing of such items as appear the following numbers:

No. 5 Cash
No. 25 Expense
No. 35 Improvement Acct.
No. 55 Mdse. Acct.

The others numbers shown indicate the individual acct. numbers.

At the close of the month if one wishes to prepare trial balance sheets the total mdse. sales and purchases are readily found. The Debit & Credit sides of the Cash Acct. are obtained. Then the various items as Rent, light, heat, Expense, wages, etc., are accounted for. Go over all the ledger cards in the "open account tray" those that "balance" may be then placed in the "closed account tray" until further needed, this is recommended as it saves handling unnecessary cards and it also gives at a glance the open accts. due, also the accts. payable.

Never buy goods for cash or to be charged without a numbered order blank (in duplicate) when the goods are received check and date your duplicate and file it properly in your "Macy Day file." When the Invoice arrives verify each item and then stamp the same ready for posting.

Never return the original Invoice or Statement with your check when settlement day comes. Use your own receipt blanks, which should be mailed with your check. If the statement designates a certain percentage of discount deduct the same if you pay promptly and post it to the D and L Acct. at the proper time. I find it a good plan to also write across the Invoice or Statement when paying the same something like this, "Paid 7/14/13 check No. 839." In case of delay or loss in receipt of your remittance, this cross reference will be found helpful.

I might go into this subject more thoroughly if space permitted, but I feel the skimming over of the subject will be sufficient to interest many to plan and adopt a like system.



WHERE THE WAVES MEET. JOHN CHISLETT.

A PAGEANT OF THE SEA

By WILLIAM FINDLAY

THE accompanying illustration was a chance snap-shot taken one beautiful July morning some years ago, not long after I had been initiated into the mysteries of photography. What plate it was secured on I forget, but the lens used was a Bausch & Lomb R. R. with a shutter by the same firm, and the exposure given was 1/100 of a second. The print from which the reproduction was taken was from an untouched negative. If the negative has a fault it is that it is a trifle hard, and with certain classes of Bromide paper the resultant print is hard also.

The aim of a photographer in quest of pictures of this nature, where the contrasts are exceedingly great, ought to be to secure a soft negative, and any recent ones I have secured have been of this nature. The developer used was Pyro-soda, with just as little Pyro as possible. When the image appears, or rather after all the principal features in it are visible, the plate, without any washing, is placed in a pail of cold water; the pail is covered up; the light in the dark-room turned down, and it is left there to develop itself for a half-hour—perhaps an hour—for there is no harm done if left even longer. Then a normal Pyro-soda developer is made up, the plate put into it, and in a few minutes it gains the density desired.

The negative thus secured, if the solutions have been fresh (an important point), has even detail, brought out with the gradations beautifully rendered, of a quality eminently suitable for enlarging.

Most Pyro-soda formulæ give an equal quantity of soda and sulphite, but if a slightly larger quantity of sulphite is used a clearer negative is the result, which cuts down the exposure in enlarging considerably. And another point, Ortho plates were not so largely used at the time the negative was secured.



Illustrating Article "A Pageant of the Sea," by William Findlay.

They are almost universally used nowadays, and a plate that has been found eminently suitable for this class of work is a non-filter Ortho plate of considerable speed—a slow plate is undesirable. Owing to the increased exposure necessary, the movement of the water and the craft incorporated in the composition the use of a filter is out of the question.



MISCHIEF. A. W. H. WESTON.



CHILD PORTRAIT. ELLIOTT STUDIO.

SPEED TELE-PHOTOGRAPHS

By GORDON BELMONT

SPEED tele-photographs, such as it is possible to obtain with the new Ross fixed focus Telecentric F/5.4 lens enable the user with a short bellows extension to obtain large images of fast moving objects from a distance. Be it the lofty, swift soaring aeroplane, the spirited thoroughbred going over a six foot hurdle, or the intrepid big-game hunter catching a venturesome picture of the charge of a dangerous Rhino in the British East African wilds. This lens is unquestionably to be reckoned with as one of the noteworthy and important lens equipments of great interest for the 1914 worker.

The writer's successful experience the past season, confined mostly along the lines of Press, Society and Sporting illustrations, was with a 17 inch F/5.4 Telecentric, used on a 5 x 7 focal plane, reflecting hand camera. Its wide range of efficiency adapted it to all outdoor subjects and coupled with the large aperture enables one to get instantaneous, sharply defined, large pictures, nearly three times the size possible with an ordinary lens, even under the most unfavorable lighting conditions, thus making it of superior value to the amateur and professional photographer. This ability of rendering images of a true and natural perspective, free from distortion, is of high technical value.

A typical motion picture made by the writer illustrating the speed and remarkable definition of the F/5.4 Telecentric at full aperture is shown in the accompanying reproduction (Figure 1.) of the thoroughbred hunter going over a six foot hurdle at the Newport Horse Show. This photograph was taken with one-eighth inch opening of focal plane shutter, 1/1000 of second exposure on Seed 30 Gilt Edge Plate, in bright, but not direct sunlight, 4 P. M. at thirty feet distance.



Figure 1.

Illustrating Article "Speed Tele-Photographs," by Gordon Belmont.

Even with this rapid exposure the detail is excellent. The rider's facial expression and the quivering, muscular anatomy of the thoroughbred, are quite forcibly brought out. All motion, likewise, is completely arrested.

Owing to the fact that the great reading world has been trained to look for photographs which at a glance tells a timely story, or vividly depicts some public event of general interest, there has been created a never-ending demand from Editors of the leading monthlies, weeklies, and the lavishly illustrated art supplements of the Metropolitan Sunday papers, for "snappy" and interesting news pictures. The portrayal, therefore, of passing events of every-day life and happenings of public interest, offers a profitable field to the photographer.

The photographs mostly in demand are those showing the persons "doing" something. If some millionaire's debutante daughter is clever at horsemanship, or an athlete, she is desired to be pictured in action, her horse going over a hurdle at the famous Society Horse Show, making a drive at the Golf Club Links, or perchance a fancy dive at the bathing beach. Such a lucky snap-shot is a big money winner and one to receive the most favorable attention from the publisher. For instance, at Newport, R. I., where during the summer season is gathered the "fashinable set" known as the exclusive "400," there is daily to be found in attendance at their numerous outdoor pastimes and gatherings such as Tennis, Polo, Golf, Yacht Races, Fox Hunts, Horse Show, etc., many opportunities for picturesque groups and single portraits.

Such occasions give the Fashion and Press Illustrator excellent chances to obtain good paying material. Such snap-shots can be taken with a three inch shutter slit at 1/50 of a second, stopped down to F/8. If unusual detail is desired, and good sized figures, they can be obtained from a distance of thirty or forty feet. If you request your subject to accommodate you by posing you are usually met with an "oh, no thanks", or worse yet, with a scathing, sarcastic look of silence. The only course left is that of snapping your party at the first available chance, and with as little obtrusiveness as possible. Right here comes in play one of the vital and essential items of the Press Illustrator's equipment, that of



THE DEAD PIGEON. KATE MATTHEWS.

possessing a speedy, long-focus lens such as will allow him to stand thirty feet or more away, and without attracting attention, obtain a large image. This requirement is admirably met in the Ross Telecentric F/5.4. After a half dozen years campaigning with a ten inch anastigmat, and the necessary maneuvering to approach into close enough range to catch a social "celebrity" in some exclusive Casino or Club enclosure, all out in the open, without a chance to conceal yourself, or your conspicuous camera, the value of the Telecentric lens has impressed itself upon the writer.

These experiences recall many painful memories of failures, mental tortures suffered, echoes of "cuss words" hurled at my ears and often a polite and forcible ejection through the gateway as the result of a desperate charge with the ten inch lens to steal nearer to the object in order to get a larger picture. Now, with the coming of the "Telecentric" with its dual advantages of rapidity and long range, all the above harassing discomforts are eliminated.

Summing up some of the capabilities of the Telecentric lens F/5.4 from the writer's years of experience, the lens is a wonderful combination of great rapidity and sharp definition producing negatives of uniform, brilliant illumination adapted to an exceptional degree for enlargements. I have found it an ideal lens for high-speed work, such as racing and jumping horses, well nigh indispensable for Press and Sporting events, home portraiture, architectural detail, distant mountain scenery, Natural History, wild animal and bird work.



H. OLIVER BODINE.

W. A. Towles.



Illustrating Article "Night Photography," by Charles M. Smyth.

NIGHT PHOTOGRAPHY

By CHAS. M. SMYTH

WHILE night photography is fully as fascinating, if not more so than any other line of outdoor photography, it is also one of the most difficult. The extreme range of light gradation between the brilliant arc lights which shine directly into the lens, and the dark and almost unlighted portions of the remainder of the picture, make a picture which is next to impossible for the camera to portray as the eye sees it. But the principle is the same wherever applied in that that which is the most difficult to attain is the more beautiful and highly prized when once possessed.

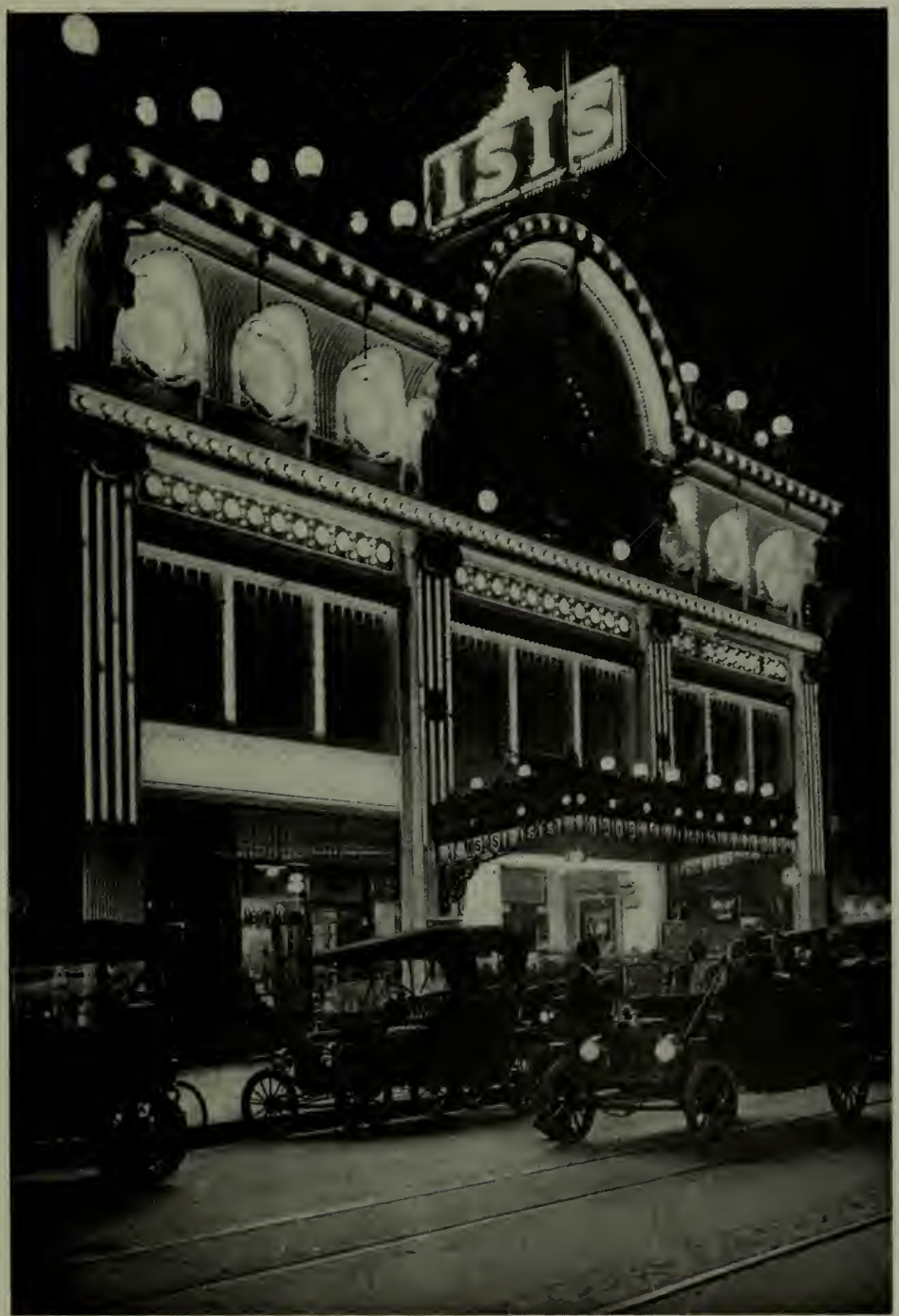
Photographers who are accustomed to searching out the beautiful here and there have discovered long ago that the

scenes along the brilliantly lighted city streets when thronged with the gaily dressed pleasure seekers are the most enchanting of all. Views which, when photographed in the day time while the sun is shining, make mere portrayals of busy street scenes, when taken after dark and while the myriads of lights are lighted, are changed to the most fascinating pictures. But discouragement is usually in store for the photographer who attempts them.

He finds that the bright lights cause annoying halation and ghosts upon the plate and the shadows which appeared so grotesque and fascinating refuse to appear as they were seen. In most instances he has not the time to experiment and search out the best methods for producing the photos he would like most to have, and consequently gives it up in disgust. The one who keeps at it will find several essentials necessary to produce the best results. His difficulties will be numerous and he will require unlimited patience, perseverance and dogged determination.

The photographer who possesses the requisites, coupled with the time and knowledge to experiment intelligently, will be rewarded with what will likely be the most gratifying of all his pictorial possessions. And when he discovers the best method for improving his results, if he in turn gives it to others striving for like results, he proves that he possesses the spirit of true sportsmanship. Such a person is R. Williamson, M. D. M. E., of London, who has experimented untiringly until he has attained excellent results, and who now gives his methods to the public through the "Photographic Journal"—the official publication for the Royal Photographic Society of Great Britain.

While I had previously found some difficulty in making correct exposures, my chief difficulty lay in the proper developing of the plates. When my attention was called by a friend to Mr. Williamson's method of development I did not have the courage to try it because of my inexperience in the mixing of solutions. I called to my assistance a friend who is a photographer and a thorough chemist (Mr. Ed. F. Hickish), and with his assistance we have attained with Mr. Williamson's solution the results shown in the accompanying photographs.



Copyright, 1913, by Smyth & Hickish.

ISIS.

Illustrating Article "Night Photography," by Charles M. Smyth.

The formula, as given by the "Journal" follows:

SOLUTION NO. 1.

Pyro	1	drachm.
Potassium meta-bisulphite	½	drachm.
Water to make	5	ounces.

SOLUTION NO. 2.

Sodium Carbonate (crystals)	½	ounce.
Sodium Sulphite (crystals)	½	ounce.
Water to make	10	ounces.

For working solution take ½ ounce of No. 1, 2 drachms of No. 2, water to make 2 ounces and 1 to 4 drops of 10 per cent potassium bromide. Let the negative remain in this for five minutes, then add 2 drachms more of No. 2. When the high lights begin to appear dilute the solution as development proceeds with an ounce of water at a time until the high lights are sufficiently dense. Then rinse under a tap and let lie in plain water fifteen minutes to bring out the finer details in the under-exposed parts. The temperature of the developer should be 55° F. The adding of the bromide retards and minimizes halation; so a plate where bright lights appear requires more bromide than one where the lights are not extreme. Too much bromide is deleterious.

A word as to how to make exposures might be some assistance to those who are not familiar with the subject. Stand your camera in a position where pedestrians or passing vehicles will not be apt to disturb you. Focus upon the scene you wish to take, insert the plate and draw the slide, and then wait. Don't be in a hurry to take the picture but watch for an opportune time. There will be occasional moments when all those in range of the camera will appear quiet at once. Then is the time to be ready and to open your shutter. Hold it open as long as you see no movement. The length of exposure necessary will, of course, depend upon the amount of light surrounding the scene being photographed, and will range from one to four or even six seconds. Maybe just as you open your shutter someone will move sufficiently to spoil the plate. Don't be discouraged but insert another and try again.



THE EARTH POT AND THE IRON POT (Ravlins Process). A. Gomez Gimeno.

It will pay any photographer who is interested in night photography to try Mr. Williamson's method of development, and he will be surprised to find with what ease he can attain the results which he has striven for so long.



SEGO LILY. C. E. BISBEE.

HEALTH IN THE DARKROOM

By V. SERIN

THOSE who have not electric light in their darkroom are well aware of the noxious fumes given off by oil or gas lamps, also the awkwardness of same when using bromide paper for printing, owing to the light having to be turned down while loading the frame, or else yellow light used, then taken away to make the exposure.

I overcame these difficulties in a very simple manner. My darkroom is in a shed outside. The first thing was to decide where the light should be. Having settled that I cut an opening about 10 x 8 inches in the side of the shed, put a shelf on brackets, fitted a gas burner on same (running pipe through the shed to the supply and interposing a stopcock). Over this was placed a tin (an old biscuit tin will do) with opening cut in the top and a chimney fixed. Almost anything will do as it need not be light tight, simply to keep out wet and allow for the fumes to escape. A few air inlets are cut in the bottom, and as far as outside work is concerned, this completes the job.

Now, inside the shed, or room, put some grooved strips up either side of the opening, to take the safety light or glass (allowing over lap of two inches both sides of the opening). Those for 10 x 8 inches need to be twenty inches long. The top ten inches should be boarded over to act as a light trap when the glasses are down.

Now, take the safe light, stick a piece of leather, or strong cloth, to the top center, attach a piece of cord to it, and drop the glass into the grooves, carry the cord up to a pulley wheel fixed on the side of the shed, take the cord over to left or right as preferred, to another pulley and then down to a hook, so fixed that when the cord is slipped on to it the glass is up leaving the opening clear. (Figure 1.)

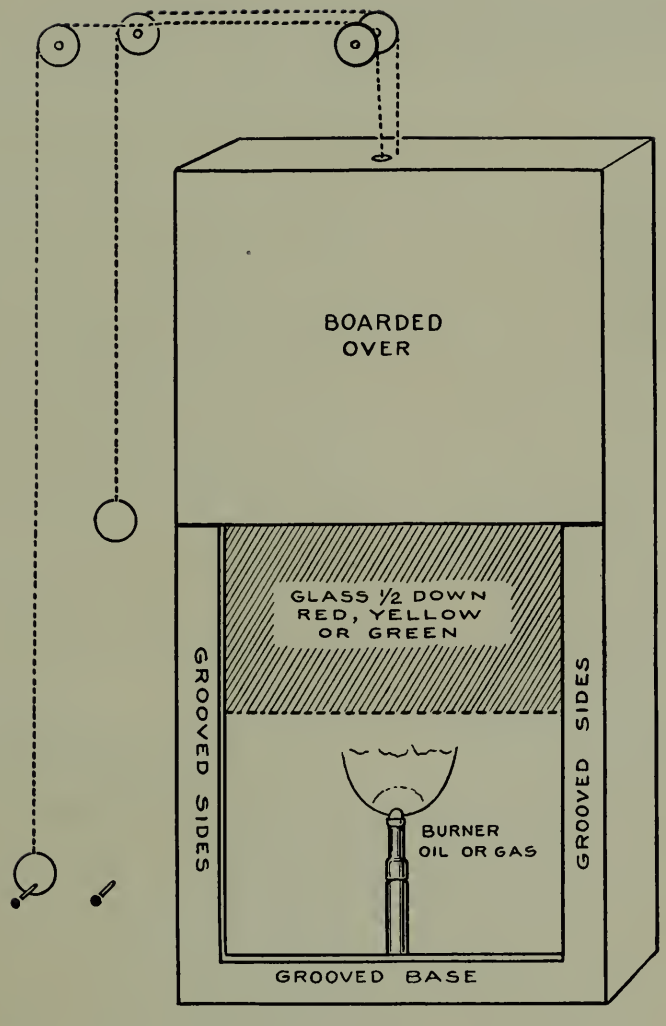


Figure 1.

By means employed as above I can get any light at will by pulling cords. I use three colors, green for panchromatic plate, red for ordinary and yellow for bromide paper. Red and yellow combined for fast ortho, and by simply pulling the cord of the yellow glass I can make my exposure for bromide paper, drop the glass and develop the print without having to light up, or strike a match or any other means sometimes adopted for exposing bromide paper, and above everything else all fumes escape into the open air and none can come into the darkroom.

ARCHITECTURAL PHOTOGRAPHY: ITS FUNDAMENTAL REQUIREMENTS

By HENRY C. DELERY

ARCHITECTURAL PHOTOGRAPHY occupies to-day a most prominent place among the different phases to which this Art-Science has been applied, and its importance is sufficiently attested by the generous patronage of both the architects and general public.

To properly reproduce the work of our great architects and designers requires a thorough knowledge of the laws of perspective, coupled with a keen perception for harmonious composition.

Perspective is the keynote for an architectural photograph and the one feature which requires the photographer's special attention, and therefore when about to photograph an edifice a general survey of the same should be made and its lines carefully studied.

The point of sight, or the place from whence the camera is set, should never be in close proximity to the object, but rather removed to a distance about three or four times the height of the building. The reason for this is obvious, as a position taken too close causes the vanishing lines of the building to become very abrupt, sometimes distorting the image so that the character of the design may be entirely lost.

It would be well for the photographer to make a complete tour of the grounds before selecting his point of sight, especially so in residential work, noticing all the different features which may present themselves, especially the skylines. Some part of the picture should be given more prominence than the others, so that in the finished photograph the eye may find an attractive point to rest upon and not wander aimlessly over the whole. Still, it must be kept in mind that in order to emphasize some special feature, the whole composition should not be sacrificed. A position should never be taken directly opposite a corner, making the vanishing lines of equal length, which



When the head in grief is bowed
And all seems dark with sadness,
The sun breaks through the blackest cloud
And shines the heart to gladness.

CHARLES M. SMYTH.

produces a very unpleasing effect. It is far better to give more prominence to one side, preferably the front of the building, and subdue the other side to secondary importance.

The selection of a point of sight in regard to the height of the building must also be carefully considered. In general for residences, a position at the ordinary height of a man produces a pleasing perspective, but for lofty buildings or high monuments, a station should be taken, if possible, at about one-third the height of the building, taking care, however, to avoid placing the horizon line too high, a defect which may ruin the picture, and it is a good axiom to remember that a low point of sight gives altitude to a building whilst a high one tends to render it low and squatty.

Secondary to perspective, the composition, or the proper application of the principles of light and shade, and making the best use of the natural backgrounds, and careful arrangements of the foreground, requires the careful attention of the photographer. With all these features carefully studied there remains but little to produce a perfect picture.

A photograph, to be of service to the architect, should be clear and with very sharp definition showing all the detail possible. Our artist friends of the "fuzzy" type may object to this method, nevertheless, whilst a blurred and indistinct picture of a building might make a pretty picture and appeal to a certain class of people, it will be of little service to the architect or designer.

Proper study must be given to light, and shade and shadows, and a knowledge of the difference between these factors, the former constituting what we might term the "high lights" or most brilliantly lighted portion, and the latter, caused by objects obstructing the direct rays of the illuminating body. Shade differs from shadows, as it implies no particular form or definite limit, whereas shadows represent in form the object which intercepts the light. One side of the house may be in total shadow, yet that shadow imparts no idea of its form or dimension, but the cornice of the same house may cast a shadow on its lighted side and immediately gives some idea of its size and shape.

It then follows from the above that that side of the building which is most brilliantly lighted becomes more prominent than



LOOKING FOR SHELTER. CLEO S. BOURGEOIS.

that in the shade, and it affords the photographer an admirable opportunity to accentuate those parts which most require it and subdue the others.

The photographer should give as much attention and study to the lighting as the artist would in his studio, and it would repay him to notice the time of day when the structure appears at its best, and expose his plate accordingly, remembering that whilst the artist can modulate his illumination at will, the photographer must accept the light as it comes, using his judgment to secure the best results.



DOVE DALE, DERBYSHIRE. H. C. ALLEN.



THE LUMBERJACK. H. M. LONG.

WINDOW-PORTRAITURE

By HARRY D. WILLIAR

A GREAT deal has been written about window-lighting and home-portraiture and a number of books published on this subject, indeed so exhaustively has it been treated, that I do not think I can add anything new. Nevertheless, some of your readers who have not read the publications on this subject, may gain some help from what I am about to say, and if these remarks assist even a few, their purpose will have been accomplished.

There was a time, and not so many years ago, when it was thought impossible to make a good portrait without a sky-light, but this idea has been exploded and relegated to the past. I have seen a great many portraits made by window-lighting which gave all the delicate flesh-tints, tones and half-tones fully equal to skylight or top-lighting of any gallery.

It is conceded, and in fact must be admitted, that a north-light is by far the most desirable source of illumination, as it is more steady and more reliable and avoiding the strong high-lights and shadows that a south light or other lighting is likely to produce. But, unfortunately, not all of us can control the location nor select a north exposure, and therefore, have to make the best of the situation and use a room that is most available. Being in this unfortunate condition, if unfortunate it is, I am compelled to use a room which has the south light, and with sun streaming into it all day long, but by a method possibly not entirely original, I have overcome some of the difficulties of this exposure, and yet, as a rule, I do all my indoor work just at the very time the sun is pouring in the windows, from 10 A.M. to 3 P.M. but I do not think the prints submitted, show any streaks or sunlight which are at times, difficult to avoid.

To make plain the preventive, I cover a large south window with a frame of light woodwork. Covered in front with a



EXPECTATION.

Illustrating Article "Window-Portraiture," by Harry D. Williar.

double thickness of some light material like cheese cloth, chiffon on anything else of this character, and according to my experience, these materials are preferable to muslin, sheeting or other closely woven goods, and of which a single thickness would, no doubt, be sufficient, but I like the soft effect of the chiffon and its subdued diffusion of the sunlight. On both ends of this frame work, black cloth is tacked so there is no back lighting, but all the light is controlled and passed through the diffusive material referred to and falling on the subject with practically the same effect as a gallery side light.

When the sun's rays enter the room and are falling directly on the subject, I correct this by means of silk, pongee or some other material of similar character that will cut off these rays and soften what would otherwise be too strong a light. The bottom of the frame work is covered with a piece of black cardboard or cloth, but any other opaque material will answer. This I can shift up or down the frame to cut off the light from any part of the subject as may be desired, and it is regulated to cut off more or less light by screw-hooks on each side of the frame and rings in the black material and so that the light may be partly dispensed with or allowed to enter from the whole length of the window if desired, or as little as may be needed.

The windows are fitted with the usual spring roller blinds as is customary in most houses. I simply let the blinds go to the top of the window and then draw them over the top of the frame work, which is out from the top of the window about two feet while the bottom of the frame work rests on the window sill. By this you will note the light enters the window at an angle of twenty or twenty-five degrees, and is thrown directly on the subject, and somewhat similar in effect to a gallery lighting. The black cloth or cardboard is raised or lowered from the bottom as may be necessary to give me just the lighting that I need, and raising or lowering it to meet requirements. Usually, the double thickness of cheesecloth or chiffon tacked on front of the screen, is sufficient without any further shield to subdue or cut off the light, but if not sufficient, and the sun shining directly in the window and its rays falling directly on the subject, then I loop back the silk or pongee above referred to. This, like the black screen



AN OLD-FASHIONED GIRL.

Illustrating Article "Window-Portraiture," by Harry D. Williar.

at the bottom, is fitted with rings and in two sides of the frame work, is fitted screw-hooks, four or five inches apart, so that the material can be looped back into as many thicknesses or folds as may be desired.

Now, some may say this is an expensive arrangement, but it is not, and any one with the least idea of carpentering may fix this whole arrangement at a cost of two or three dollars. I made mine complete, without any assistance, and it did not cost two dollars all told, including lumber, screens, screw-hooks, rings, cheese cloth and other material.

To get the most pleasing and natural expression of your model, a short exposure is needed, consequently, the better or stronger you light your subject, the shorter your exposure. Do not tire your subject with any unnecessary delay, and I don't mean by this to hurry needlessly, but prepare beforehand, have everything required in readiness. Your camera in position as well as background, your holders filled and your lighting as far as possible, as well as your reflector, in such position as you are accustomed. Then, when your subject is seated or standing as may be, the minor details as well as apparatus can be quickly regulated, and before your subject has become tired, or loses the happy expression which is usual in most instances in having his or her picture taken.

My idea of backgrounds is simplicity. Avoid as far as possible unless for some special subject, such backgrounds as trees, shrubbery, porticos, spacious interiors, etc., etc. A light tinted grey seems to give the best effect, but for children, usually white, cream or some very light tints are used with success. Of course, there are times when a dark background is wanted and may be most desirable, and especially with some studies, and if you can afford it, it would be wise to have two. A dark background on one side of your stand and a light one on the other. Of course, a light background can be made to appear darker or a dark background lighter, simply by changing its position to or from the light and by reflection. A very nice effect can be obtained by using a light toned felt for a background, and I have often used a piece of unbleached sheeting, tinted to such shade as best suited my purpose, but all these are matters of pocketbook, taste and a little labor.

As to the lens, a high priced or expensive one, need not be



MEDITATION. HARRY D. WILLIAR.

considered essential in the making of a good portrait, but a high priced lens, while not condemning when properly handled, yet, usually these in the hands of the tyro are apt to make a portrait too wirey, while on the other hand, a cheaper lens will more likely give softness, a pictorial effect and more lifelike expression, which is decidedly preferable from an artistic standpoint, than those sharp wirey portraits that we see daily in the show case or windows of some professionals. In point of fact, within recent years, many of the very best, and most artistic workers are using diffusive lenses, and in many instances, the meniscus or single lens, and really, I have

seen some beautiful work done with a lens of pristime make, but I am not advocating these in preference to a good medium priced portrait lens of a reputable maker. Of course, a medium priced or cheap lens will not likely be found as rapid as some of the higher priced ones, but with most subjects, an extremely rapid lens is not needed or at all events, not an absolute necessity, although with children, and especially very young ones and babies, constantly restless, a rapid lens is better.

Most of my work is one and one-half to two seconds exposure, and not often exceeding three seconds, and it is but seldom that a child is not quiet for that length of time, if you watch carefully for the opportunity to press the bulb. A short exposure as is possible is more likely to produce a more lifelike and natural expression than a longer one, and I don't mean by "as short an exposure as is possible" any less than necessary to produce a proper and well timed negative, but am only suggesting a short exposure in order to retain the expression of your subject that suggests itself as being most natural to you.

Now, I have written about cheap lens, and some may ask what do you mean by cheap lens, what do you recommend? I am not a sales agent, nor writing this article for the benefit of any maker, but as a matter of choice, I use a Wollensak Vesta F.5, size 5x7, and this is at least a moderate priced, but a good lens. Of course, there are scores of other and higher priced makes, viz: Goerz, Dallmyer, Zeiss, Ross, Beck and numerous others, but at the start, I said a high priced one was not necessary, and for that reason, I mention Vesta although in my experience I have used most of the others, and own today, several of some of those mentioned. Referring as I did to some of the high priced lens being wirey, and making such a sharp image, and so faithfully portraying all the lines of the face and frequently, blemishes, freckles, etc., not seen by the eye, and yet they are sure to appear on your negative. The resulting negative calls for very much retouching to eliminate these defects. But few amateurs know anything about retouching, and to remove these defects of a wirey lens, you will be compelled to employ a retoucher if you cannot do it yourself, and to me, it seems this retouching



GIRL AND THE VASE.

Illustrating article "Window-Portraiture," by Harry D. Williar.

is carried to an extreme, and in instances, destroys the likeness as well as the personality of your subject. In point of fact, I have seen the work of some professionals, while beautiful in effect as to the printing qualities and the handling, yet all semblance of the original is lost, the portrait made to look ten to twenty years younger by retouching, and in instances, have absolutely not been able to identify the picture of most intimate friends. I dont mean to say all this can or will be avoided by using a cheaper or more diffusive lens, but I do think a great deal of the wirey effect will be eliminated, less retouching if any at all, and a better likeness the result. Practically, I do no retouching whatever, and I am sure in consequence, a better or more natural and lifelike portrait.

As to the developing agent, any good one will do, and this is merely a matter of choice or what you are accustomed to. Usually, my favorite one for various reasons, has been Metol Hydro, but in experimenting recently, have been inclined to give preference to Amidol 10gr. Sulphite 100gr. to one ounce of water, and then dilute some five or six times, as I prefer a soft negative, and this formula with me produces a nice soft negative full of detail and gradation. Of course, depending on your exposure, this dilution may not be enough or may be too much, but you can readily add more water or more developer as may be needed, but should your negative flash up in twelve or fifteen seconds, do not get alarmed, as this is not a sign of over exposure, but it is the peculiarity of Amidol. After flashing up in twelve or fifteen seconds, it then goes on, building up slowly, and it takes just about as long to make a finished negative as most any other developing agent.

I have said nothing as to a reflector, but of course, with window lighting this is essential, and more or less so, depending on the wall covering or papering. With a soft cream or light tinted wall paper, probably at times a reflector may not be needed for certain lighting, but it is well to have one, and especially, as it can be easily made at a trifling expense. If your wall paper is dark, and does not reflect but absorbs the light, then the shadow side of your subject will necessarily need a reflector.

As to the position in which to place your reflector, just how and when to use it, can only be determined by experience, and

it will not take long to learn how to control it, if, when your subject is seated, you test its action in various positions. Of course, the side of the face away from the window will be in shadow, but this can easily be lightened up and to meet requirements by simply reflecting the outside light on to the shadow side. "Experience is the best teacher" and more can be learned by a few tests than by trying to tell you just how to do it.

Now, as to home-portraiture, I can only say in conclusion that if you once try it and will persist in trying it till you feel that you can make a good picture of your wife and children, your relatives or your friends, if you will persist in your efforts till this conclusion is reached, and your subjects are willing to concede that you can make a satisfactory portrait, then I am sure you will admit that "home portraiture" is one of the most pleasant features of photography, and that for the time and efforts spent you have been well rewarded, and there will be no regrets on your part other than the wish that you had made the trial sooner.



A WINDY DAY. GERTRUDE AITCHISON.



A CANADIAN SUNSET. HARRY GORDON WILSON.

THE CHILD AND THE KODAK

By HARRY GORDON WILSON

I HAVE always had the idea that photography should play an important part in the education of the child, as through the use of the Kodak or camera children will have something to take up their leisure time when not occupied by their school lessons.

This may mean a little expense and patience to the parents, but they may rest assured that their time and money will be well spent. The kodak will open up new fields of thought, unfolding the beauties of nature in its many different phases, teaching the child the love of the beautiful, educating the eye to estimate distances, and to be able to see things that the ordinary person would pass by without a moment's thought of the picture possibilities. In my own experience I have yet to find very few people who are interested in photography who are not good upright people, both morally and mentally. If you know that your boy or girl is out with a kodak with a goodly supply of films, you may rest assured that he or she



OLD HOUSES. HEINRICH KREBS.

is not getting into any mischief and that they are learning something that should prove of great benefit to them when they are grown up.

The modern photographic equipment is very simple, and any child of average intelligence should be able to master the first principles in a very short time. It is recommended that they complete all of the operations themselves, as by doing their own developing and printing they can discover any errors in the exposure. You will always be able to find one or two older boys in the neighborhood who will undertake to give the young photographer a few first lessons.

In a recent camp of the boy scouts near London, England, the boys were supplied with an inexpensive kodak and were given a certain route to cover, different detachments were sent over this route at different times with instructions to discover and photograph certain prominent landmarks, such as a clump of trees, farm houses, etc. The negatives were all developed, prints made and prizes given for the best work. Later on in the season these prints were given to other detachments with instructions to go over the same route using these prints as guides.

The above information was secured from a little booklet issued by a prominent photographic concern of this country.



MOUNTING SKYWARD. CHARLES H. FLOOD.



PASTORAL. LEWIS J. FITLER.



THE BEES TOOK TO THE WOOD PILE.
Illustrating Article "How to Photograph Honeybees," by Edward F. Bigelow.

HOW TO PHOTOGRAPH HONEYBEES

By EDWARD F. BIGELOW

BEES in the popular estimation are proverbially hot, but I recently had a surprising instance of their clustering where I was intending to make things hot. We had to cut from the shrubbery and trees at Arcadia a few white birches that it was impossible to make grow, and had placed them in the middle of the garden in a convenient pile for burning. The pile had just been completed and I went for a little excelsior to help the match. Having placed within the mass a ball of excelsior about the size of my head, I was amazed to find, on my return with the match, two hours later, that a colony of



IT'S JUST FUN TO DO IT THIS WAY

Illustrating Article "How to Photograph Honeybees," by Edward F. Bigelow.

honeybees had located themselves in exactly the place where I intended to start the fire. My attention had been called to matters in the office and it was some two hours before I returned, and there were the bees. It was a simple matter to shake them down at the mouth of a traveling hive and soon have them in their regular domains.

The next day another colony came out and alighted this time on one of the larger pieces of white birch. A stenographer in the office, desiring to have some experience with honeybees, was shown how to saw off the limb and place it at the mouth of the hiving hive. But in doing so we photographed her in several poses to show how gentle the bees were and how well they will respond to kind treatment. The accompanying illustrations show some of her experiences.

In photographing honeybees the best lens to use is not necessarily a fast one, because it is impossible even with the very fastest lens to show the bees in flight to good advantage. I have found by experience that there is no great advantage in a very fast over a slower lens. I have used the No. 9 Protar most extensively, preferably the front combination only. This is 16½ inch focus and puts the camera far enough away to get the depth by distance rather than by stopping down. Readers of this Annual are familiar with my previous arguments that short focus is not necessarily greater depth than long focus. When the long focus is the means of putting the camera away from the object there is greater depth in the thing photographed. Indeed, it is a moot question as to just how much we should claim great depth for short focus lens and lesser depth for long focus. The trouble is in most cases that the comparison is not made as it should be on the same size image on the plate, and therein hangs a very vital point. If one is to *fill* the plate that effect is not well obtained by a short focus near to the clustering swarm because a large part of it will be out of focus.

As, for example, with the No. 9 Protar there is not only this trouble of out of focus, but the greater danger of getting stung in using the whole lens. If only the half lens is used the distance is sufficient to get the whole thing into focus with clear opening. If the whole lens is used one has to stop the lens down so much in order to get all into focus that there is



THE BEES LEAVING THE EXCELSIOR AND GOING INTO THE "HIVING" HIVE. EDWARD F. BIGELOW.

not much speed left and the movement of the bees will make a blur.

When I hear the call, "The bees are swarming," the first thing I do is to unscrew the rear combination of that Protar. It is a time when distance not only lends enchantment to the view but safety as well.

Perhaps some camera friend will at once arise up and say, "Then why don't you use a telephoto." That is, indeed, very advantageous on some occasions. When the swarm is well settled in a cluster far up on a tree the telephoto is the proper thing to use and by waiting perhaps an hour after everything is at rest the bees hang so perfectly still that three or four seconds can be given for the telephoto. The so-called artistic photographer who unscrews his rear lens to throw his lens out of focus, or uses what is called the soft lens, has no place in photographing a swarm of honeybees. *The beauty comes in the detail.* The photograph that does not show the markings on the bee or the individual bees within the cluster would be useless. As well might one hang an old hat on the limb

and photograph that if it were going to be a fussy, foggy photograph. In photographing the details of honeycomb I find it advantageous to use a very short focus lens on a long focus camera. I use a 5 inch Goerz Dagor on a 6½ x 8½ camera with nearly four feet of bellows extension. That lens gives a beautifully clear enlargement and I have found it the most useful of any form for photographing detail so as to show in the photograph about what one would see using a one inch pocket magnifying glass. I cordially recommend phhotographing of honeybees to my fellow amateurs because there is the charm of the danger in it—the same principle that inspires the hunter to brave the lion in the jungle with his camera, should inspire the photographer of honeybees. There is no other kind of photography that gives just that same feeling that it was a little dangerous and yet I did it well. Still there is not really so much danger as there seems to be. The principal caution is to move slowly and make all motions leisurely. The bees have a dislike for the camera and sometimes will attack it vindictively. It is well to place it in position and then step back and let them get accustomed to it as a *perfectly still object* before there is any attempt at manipulating the camera.



COPPER MOUNTAIN FROM BOULDER BAY. *Copyright, by P. S. Hunt.*



THE LAST STITCH. GEORGE S. SEYMOUR.

HISTORY IN PHOTOGRAPHY

By GEORGE S. SEYMOUR

A VACATION tour with a camera may not be a novel suggestion, but the outline of such a tour, having as its object the collection of a set of photographs interesting from a historical as well as a pictorial standpoint, should be of use to those who desire new worlds to conquer.

We will start our tour at Utica, N. Y., and will cover a territory rich in history as well as abundant in scenery, so that all our inclinations may be satisfied. The city itself is

chiefly of interest to a photographer on account of its old buildings which recall a day and generation long past. The Roscoe Conkling mansion on Rutger St. directly facing John, in which Governor Horatio Seymour died, is one of them. The block on Whitesboro St., now almost a slum, where at No. 44 Governor Seymour made his residence, were once grand residences. The searcher will find many others put to all sorts of base uses.

Take a westbound trolley to Rome. Before leaving Utica we pass one of the many stone monuments erected by the Daughters of the American Revolution in this region, this one to mark a resting place of the army of General Jacob Herkimer on its march to meet the British General St. Leger. A short ride brings us to the old Dutch village of Oriskany. Here beside the track is another marker, designating the spot at which Herkimer camped the night before the battle, August 5th, 1777.

Let us take the next trolley and ride on a couple of miles further. We alight in the midst of rolling fields, and at the top of a steep hill is a lonely column, the Oriskany battle monument (Figure 1). Here photography becomes patriotism, for this majestic shaft marks one of the most solemn moments of the Revolution; the turning point, if you choose to think it so. And when you have climbed the hill another marker shows you the spot where the wounded Herkimer sat beneath a long-vanished beech tree and gave the orders that to quote the bronze tablet "made Saratoga possible and decided the fate of a nation." It is a poor photographer that cannot accomplish something with this material.

Returning to Utica and taking the trolley to the eastward we arrive at Little Falls, a spot whose scenery will give us many pleasing landscape views. Let us not linger too long, however, for history is calling us. About four miles west of Little Falls, on German Flats, is a unique old stone church built by Sir William Johnson, the famous tory governor, and just west of that is the stone home of Herkimer himself, one of those homes that the Dutch farmers risked and gave their lives to defend. About three miles east of Little Falls the body of Herkimer lies in the ancient burying ground, marked by a tall monument.

Our scent for history takes us on to Palatine Bridge, where we will call on S. Ludlow Frey, an authority on the annals of the Mohawk Valley, and take a picture of the fine old colonial house in which he lives. He will tell us, though, that it is not a genuine antique, as it dates only from 1808, and will point out to us a perfectly preserved house at the foot of the hill, built in 1739 of stone with loopholes for firing at the Indians (Figure 2). Across the river we find the town of Canajoharie, a miniature Nuremberg. If you wish you may take pictures here to be made into illustrations for the Pied Piper of Hamelin. The central square has been decorated by the



BATTLEFIELD OF ORISKANY. Figure 1.

D. A. R. with a fountain inscribed, "This fountain marks the N.E. terminal of the Continental road constructed under the supervision of General Clinton to Otsego Lake, June 17, 1779." Another old stone building with loopholes, miscalled Fort Rensselaer and occupied by a historical society, is in the town. Canajoharie Creek, flowing through a deep gorge over an exposed rocky bed, will render unnecessary your contemplated trip to the Rhine.

Now we will return to the town of Herkimer and take another trolley across lots to Cooperstown. If you do not believe that Otsego Lake (Figure 3) is beautiful, read "the Deerslayer". Cooper loved it and transplanted that love to

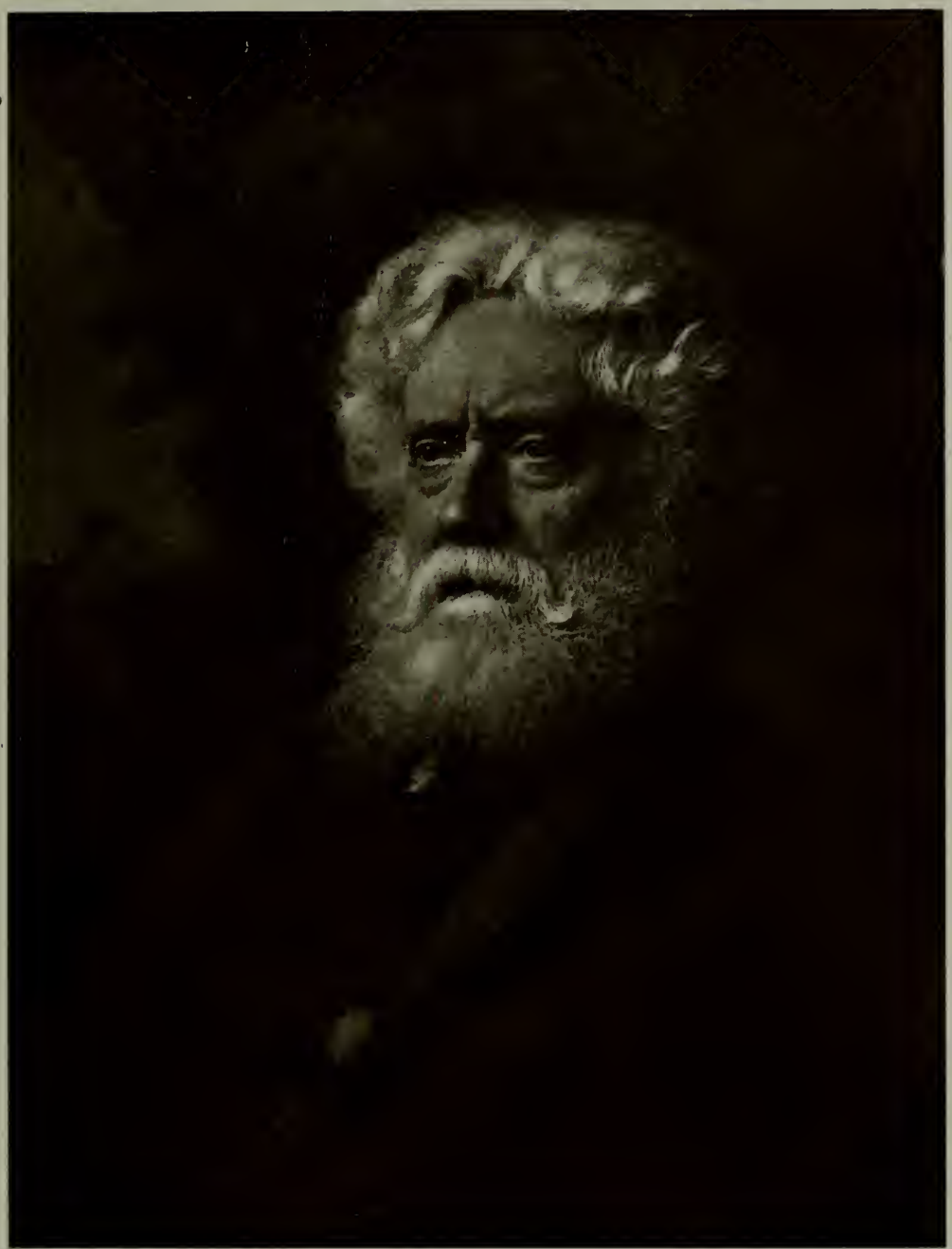
his books, so that every foot of this country breathes with the spirit of Cooper. Leatherstocking Falls, Fairy Spring, the source of the Susquehanna River, Natty Bumppo's cave far up on the mountainside, and the smooth shining lake for which Cooper had his own pet name of "Glimmerglass", are forever bound to the fame of old Leatherstocking. Tom Hutter and his fair daughters, Judith and Hetty, Hurry Harry March, Chingatchgook, the good Indian and Hist his faithful squaw, and the whole legions which people the Cooper universe. Here in this park stood Cooper's mansion and under



Figure 2.
OLD DUTCH STONE HOUSE AT PALATINE BRIDGE.

those trees he penned his books; this was the lakeside where he strolled, and there in that quiet country churchyard he sleeps the sleep everlasting. Scenery and tradition are here intermingled as they are in few other spots on the American continent. It is a photographer's paradise.

If time permits, we will go on by train to Albany, a town most rich in historical material. Here on a single block you may cover the oldest bank building in the country, the site of the home of Anneke Janse, the place where DeWitt Clinton died, the birthplaces of Philip Schuyler and Philip Livingston,



THE LATE SIR NOEL PATON. William Crooke.

and I know not what more. The points of interest in Albany are well marked with tablets, and do not overlook the Rural Cemetery in which lie the remains of many distinguished sons of Albany, including President Arthur, General Philip Schuyler, General Gansevoort, General Van Rensselaer, William L. Marcy, Thurlow Weed, and Daniel Manning. At Rensselaer on a little tree-shaded street close to the riverside, stands an old brick mansion not now occupied. The tablet tells its story "Supposed to be the oldest building in the United States and to have been erected in 1642 as a manor house and place of defense, known as Fort Crals. General Abercrombie's headquarters while marching to attack Fort Ticonderoga in 1750, where it is said that at the contonment east of this house near the old well the army Surgeon P. Shuckburg composed the popular song of "Yankee Doodle".

At Troy six miles up the river, we will find a trolley which starts from the Union Depot, and runs to Schuylerville. On our way we pass the sites of the three battles of Saratoga, namely: Bemis Heights, Stillwater and Schuylerville. The surrender monument stands in the town last named. We will go on by train to Fort Edward, for here commences a trail of absorbing interest; that of the wanderers who form the subject of Cooper's "Last of the Mohicans".

The insignificant little town of Fort Edward is of historic interest as the terminus of the twenty-five mile portage between Lake George and the Hudson, dyed deep in blood during the French and Indian Wars, so that even now it bears the name of the Dark and Bloody Ground. From this point Cooper's Major Hayward watched the forests close upon and swallow up his regiment. North-east is the city of Glens Falls, now no longer in the midst of an impenetrable wilderness. Here is to be found Cooper's Cave; where the ever-resourceful Natty Bumppo guided the wanderers to safety from Indian attacks.

Resuming the journey with Cooper's heroes we follow them to the spot where they "commenced throwing aside the dried leaves and opening the blue clay, out of which a clear and sparkling spring of bright, glancing water quickly bubbled". Perhaps we too will seek Natty's gourd, and like Hayward "after swallowing a little of the water" throw "It aside with

violent grimaces of discontent," for it is the bitter draught from Congress Spring at Saratoga.

Our next stopping place is little Bloody Pond, a pretty spot with a reputation bad enough for Cooper to have spared it instead of adding one more French soldier to its toll, slain by the hand of Chingatchgook. Its name is explained to us by Natty, who finishes his recital of the Dieskaw massacre with these words, "When all was over the dead, and some say the dying, were cast into that little pond. These eyes have seen its waters coloured with blood, as natural water never yet flowed from the bowels of the 'arth!"

Fort William Henry is at once the terminus of Hayward's wanderings and of our trip, though we are too late to witness, as he did, the massacre of the English garrison by the French and Indians on August 9th, 1757, but we can see the ruins of the old fort and the battle monuments, commemorative of the later engagement of 1775, and the ruins of Fort George, which was destroyed in that engagement. The crystal waters of historic, hill-guarded Horican will lead those who will to Ticonderoga and Crown Point, names immortal in history.

But we turn our backs on them, toting our camera, tripod and many dozen films back to the prosaic and pictureless pastures of daily grind.



Figure 3.

OTSEGO LAKE.



PORTRAIT GROUP. MARY CARNELL.

APHORISMS ON PHOTOGRAPHY AND ART

By HELMAR LERSKI

(*Translated from the German by E. F. R.*)

IT is not essential that the illumination be "natural"—Not the light effects,—but the face as represented in the photograph must convey the impression of truth. Up to the present time the worst offense of the portrait photographers has been the fact that they did not content themselves with mere surface-physiognomy, but that they applied, with great success, every available method to give to the living being the appearance of a wax figure.

Every method of illumination has the right of existence, if it is applied for the purpose of giving life to the picture, and if it succeeds in this purpose. It is comprehensible that the majority of portrait photographers insist upon estimating the value of a picture with respect to the technical qualities only, but the *artistic* value of a picture can be determined only by what it *expresses*.

The aim to give a natural flesh tone to the face must certainly be called a great progress in photography, when we think of the former almost general malpractice in retouching; —but so far it seems to be the *only* aim to bring out that beautiful flesh tone, without any regard whatsoever for the character of the person to be represented.

Every passion, every soul-stirring incident in life, leaves a certain visible trace in the face of man. To truly represent a highly emotional character in a picture it is necessary to bring out these traces. The true photographer must understand to engrave them into his negative.

The most fascinating feature of portrait photography is that the unlimited possibilities in the application of light effects enable you—without any talent for acting in your model—to give almost any desired character to your picture;—you can



SWEET INDOLENCE. Kate Smith.

make of your model a God or a Devil (there being at least a trace of each in every human being).

The application of unusual lights in portrait photography has, in itself, little value, if there is not a conscious looking into, and an intense illumination of, the character of the model. All possibilities in illumination must be utilized for the purpose of a perfect characterization,—be it to emphasize the minutest details of essential and characteristic peculiarities in the shape and form of head or face, or—what is most important—for the purpose of bringing to view the "soul depths" of a personality.

All the light used in this art should effect—not only an illumination, but also a *radiation*. To represent, in a picture, the human face—eventually also the hands—with the skillful application of all available means, and with the strictest adherence to truth,—that is the most important task of the portrait photographer.

Those diffused and indistinct photographs which are made with the object in view of obtaining pictorial tone effects, and which are still so popular, may sometimes have a certain artistic value on account of the intense aesthetic pleasure which they produce, but as to the human being that is to be represented, they express but very little.

It shows a narrowmindedness of the portraitists that they still insist upon portraying every man in his superficial, pleasant aspect, believing this to be his most sympathetic side;—and the worst of it is that, as a rule, they do not even succeed in their aim.—Very often the smile is but an affected grimace.

It would certainly be unfair to apply the highest principles of art in judging the work of the average professional photographer,—but photography may be made an art, and he who thinks of it as an art and works in it as an artist, must be governed by the noblest rules of art, and must expect to be criticized accordingly.

In all of his works the true artist must express himself in his own, individual manner.—If you cannot create your own style, you lack the originality required in real art;—you simply reproduce the impressions received from the representations of others;—you imitate the artistic productions of others.

IN A FIX AND OUT OF IT

By E. CLAYPOLE

A SHORT time ago I made a journey on purpose to record the fine Saxon Tower of Earls Barton Church, Northants, which stands on a hill terminating at the extreme edge of the churchyard, on the south and west sides, in a drop of several feet to the road from which a photograph is impossible.

In order to secure certain details it was necessary that the negative should be secured from a position at the south-west side of the churchyard, and the camera being set up at the edge of the hill at this side, it was found that the focus of the lens was too long to admit of the image being sharply defined on the plate.

To move backward was impossible, to take the photograph in section undesirable, and the loan of a suitable lens out of the question, so an experiment had to be made. The image of the tower was focussed as clearly as possible and arranged with the open shop, which produced a decided blurr. The lens was then stopped down to F 64, and the accompanying illustration (Figure 1) shows the loss of very little definition. I have found this tip very useful in copying when a certain size is required, and it is found impossible to *quite* reach the dimensions and obtain perfect definition. The stopping down will give the desired crispness of detail.



SAXON TOWER OF EARLS BARTON CHURCH, NORTHANTS.

Illustrating Article "In A Fix And Out Of It," by E. Claypole.



YOUNG AMERICAN. SIDNEY V. WEBB.

FRICTION MARKS ON DEVELOPED PRINTS

By HENRY F. RAESS

ONE of the difficulties manufacturers of glossy developing papers have to contend with is the peculiar marks and streaks which occur on the print after development. These marks are incidental in the handling of the paper after it has been coated with the sensitive emulsion and dried. It may be caused by the hangers during the drying or at some stage while being cut, selected and boxed, or even after leaving the factory, in the packages.

While glossy papers, both "gaslight" and "bromide," are likely to have these blemishes, the matte surface papers are



THE CONSULTATION. CHESTER M. WHITNEY.

not wholly free from them and at times will be found quite as troublesome. Fortunately these marks usually are only on the surface and not so deep in the film as the image proper. The latter fact enables us to remove them more or less effectively. Very often going over the prints, after washing, and just before drying, with a tuft of cotton soaked in alcohol will remove the marks. Peculiarly enough, certain grades of impure wood (methyl) alcohol will remove these marks more readily than grain (ethyl) alcohol.

A more effective solution, according to "Photographische Rundschau," No. 9, consists of a mixture of water 8 c.c. (2 drams), alcohol 4 c.c. (1 dram) and common ammonia 2 drops. If the prints are mounted wet they may be cleaned off after drying, or if the prints are to be squeegeed the marks can be removed either before placing them on the squeegee plates or treated afterwards. In the latter case it may be necessary to squeegee them again. The above methods are in practical use in the *New York Herald* dry plate department.

Another method according to the same periodical is to use a solution consisting of water 100 c.c. (3 1-3 ozs.), potassium iodide 10.0 gms. (2½ drams) and iodine (solid) 1.0 gm. (15 grains). This solution is more powerful than the alcohol and must be used with some care; it is applied with a tuft of cotton. It can also be used for cleaning up an uneven sky or removing any portion of an image. When suitably diluted it will remove the friction marks without attacking the image. After it has done its work the print must be placed in a plain fixing solution until the blue color has disappeared from the face and back of the print.

Another and older method is to prevent the friction marks from developing. This can be done by adding some potassium iodide to the developer. While this works very well, one objection to its use is that it reduces the contrasts somewhat. But often this can be allowed for by using a more contrasty paper. The yellow color (silver iodide) of the print disappears when fully fixed.



A SUGGESTION OF BARBIZON. W. H. PORTERFIELD.

THE USE OF DIAPHRAGMS OR STOPS

By JOHN BOYD

THE optics of photographic practice are not always as clear to the novice as they might be. There are so many things optically that are more or less of a blank that I think the intelligent use of that little circular hole in or about the lens of every camera is one which deserves our best attention.

Much could be said on the subject, but we will here deal only with the principal points; i.e., the numbers, the values, and the effect they have on the photographic picture.

Many systems of numbering have been put into use, but fortunately for us the makers of lens have practically discarded all but the "F" and the "U. S." The "F" system is short for "Focal," inasmuch as it is found by dividing the focal length of the lens by the diameter or opening of the stops. For example, if the stop has a "half inch opening" and the focus of the lens is eight inches, the stop number will be known as F/16. This is not mathematically correct with some types of lenses, but so little out that it will do for all practical purposes. "F" numbers usually begin at 4.5 and run up to 64. The various numbers in the series will be dealt with further on.

"U. S." or "Uniform System," which is the correct title—not "United States," or "Uncle Sam," as enthusiastic Americans are apt to call them, begin at 1, then 2, and double each time until 256 is reached. It is a handy system, as an exposure once known for any particular stop gives readily the proportionate exposure for every other stop. Thus No. 2 requires double the exposure of No. 1 and No. 16, four times the exposure given for No. 4, and so on.

To show the corresponding numbers of each system, the following will be useful:



EDGE OF THE WOODS. Theodore Eitel.

U. S. No.—1, 2, 4, 8, 16, 32, 64, 128, 256.

F. No.—4, 5, 6, 8, 11, 16, 22, 32, 45, 64.

The speed value of all lenses are identical when stopped down to the same opening. Thus any lens using stop 8, whether an anastigmat, or only a rectilinear, will require the same exposure on a given subject. Then again, at F/16 both systems are alike, this being a common radiating point for each.

Stops are used to correct the depth of definition in a picture, as well as influencing the exposure required. For instance, we focus our view with the lens wide open, getting the principal object clear and distinct, then we reduce the opening until we get our other planes sharp. This, of course, increases the exposure, but pictorially it is not always a success, as we see in the finished print everything microscopically sharp, which is different to the human eye, which has to adjust itself to the various planes as we bring them to a focus.

On fixed focus cameras the use of stops enhances their value, as by reducing the size of the opening the point of infinity can be altered. These cameras being usually of short focus, the advantages gained by getting near an object and still getting it sharp are obvious, though naturally it is considerably offset by the increase in exposure.

In using the various stops for pictorial effects, no set rule can be followed, as no two subjects bear the same relation. The universal rule is to bring the foreground and principal object into sharpness by focusing on a point where with the use of a suitable sized stop the desired result will be obtained through equalizing the depth of definitions performed by each of the factors.

Do not imagine that the smallest sized stop will always give the most pleasing result. The opposite is oftener the case, as the human eye is the judge, and its decision is based on its own facility to take in the various planes of a subject in rotation.

For a beginner we should say that F/8 for portraits and F/16 for landscapes are the favorites. Try these and learn the lesson, then experiment for results that will give pleasure to your artistic tastes.



ON GUARD. SAMUEL DORAN

CINEMATOGRAPH

By ALFRED H. SAUNDERS

Editor *Moving Picture News.*

EMANATING from the article I wrote in last year's American Annual of Photography were a number of queries from interested photographers who desired to know further particulars regarding the outfit that is necessary, and how to cut down expenses to the lowest point yet giving satisfactory and efficient work. The question was also raised; what is the use of cinematographing the various items mentioned in your article if there are no means of projecting them except by the present expensive apparatus?

Another set of queries were: What other cameras are there on the market? Are there any cheaper cameras imported, if there are no others in this country? Have you tried Jenkins' Camera, and can you assert positively that it is good from



WHEN WINTER LINGERS. JAMES THOMSON.

your own experience? In answer to the question of the projecting machine: There are three small ones made by Bingham, Dressler and Jenkins respectively, all to be sold at a cost of $75.00 each. They run the ordinary films of commerce, and are attachable to the electric supply in the house. Rheostats are provided to prevent blow out of the fuses. Bingham draws four amperes, Dressler six amperes, and Jenkins five, giving respectively a candle power light of 800, 1200, and ⁻000 respectively.

Bingham's Motoscope and Dressler's View-o-graph use the ordinary projecting lenses of commerce, and run the film in

the ordinary way giving a clear picture of approximately eight feet by ten. Jenkins' Phantoscope uses a prism, and has a double lens. In this machine the picture, or film, must be reversed, that is, owing to the prism changing the left of the picture to the right. The emulsion side of the film must be next the condenser, otherwise all the names or titles on the film will be backward.

Two other machines are being made to cost ten or fifteen dollars, but as these are mere toys, and are apt to spoil the film, they should be avoided.

Coming to the question of Cameras, during the past year several have been placed on the market. One made by Chas. E. Dressler Co. is an exceedingly good apparatus. I have tried this and can safely say it will give fine results. It is fitted complete with Panoramic Tripod, Zeiss Tessar lens, 50 mm., or two inch focus; can be used for practically any purpose needed by the general photographer; takes two hundred feet of negative film, and sells for $200.00 with four film holders.

The Erneman Company make a well known machine selling for $250.00 complete. It takes one hundred fifty feet lengths of film. They have a New York office. Whyte imports the Williamson English camera. This camera takes one hundred feet of film, and is suitable for the amateur.

Another photographer asked the question: Where do you think a poor country photographer is going to get $500.00 to start this business, and how am I going to get my money back? Right in his home town a Cinematograph Film Company paid a visit to the local authorities who had themselves taken with the Fire and Police Companies in review. A few new roads in the making were photographed along with a farming experiment at the poorhouse. A positive film was supplied, the authorities paid $1800.00 of good money for this, and the total cost to the cinematographer was about $300.00; net profit, $1500.00. This is no fairy story. It is being duplicated all over the country week in and week out. Local photographers who are helping support the community by living in the midst and paying taxes, etc., ought to be the first to reap any benefits accruing from orders such as is above outlined. Take a walk round, ask a few questions, then judge for yourselves. An-



THE NEW BONNET. RUSSELL W. TAFT.

other instance, the funeral of a prominent fraternalist took place a short time ago. Several local men were approached, but none could handle the proposition. A New York man was sent for, his charges were $.85 per foot, and all expenses. He made 700 feet of film and cleared a profit of $.70 on each foot.

Any one who wishes further information as to modus-operandi may have their questions answered by writing me care of the editor of the Annual.



THROUGH CITY HALL PARK. WILLIAM T. KNOX.



WHERE QUIET WATERS FLOW. DR. F. DETLEFSEN.



THE GLADE. J. WILL PALMER.

DOING WORK FOR THE AMATEUR

By ROY HARRISON DANFORTH

THE tempting suggestion that "You press the button and we do the rest" has been abandoned only as an advertising phrase. There are a hundred more pressers of buttons every day apparently, and the most modest druggist in the most modest American hamlet enjoys a steadily increasing income because he has learned to "do the rest." Outside of the larger cities ten years ago the man who did the developing and printing for the amateur was usually the local photographer, and he, with the professional's usual aversion for the typro, was wont to do it only by special dispensation. Steady increase in the number of amateurs has taken the task quite out of his hands. Today amateur work is cared for by the druggist and the stationer, the bazaar-keeper, the photographic-supplies dealer, and by many another who is himself just barely without the amateur ranks.



PORTRAIT. B. J. Falk.

For the man with whom such work is still on a small scale there are several suggestions that may not be unwelcome. There seem, for instance, several chief demands by the amateurs that he cannot overlook. The presser of buttons wants his work as soon as possible. He wants a large percentage of his negatives to be good. He wants the prints from them sharp and contrasty, for he considers them usually the records of interesting moments and not works of art; and, for the same reason, he wants them undeniably permanent. Besides, and here enters the question of system as the number of orders increases, he wants his own prints and not someone's else.

The darkroom worker with one or two films to do in an afternoon or evening has the time, and probably the patience, to develop them in the tank, which is undoubtedly the best way to perform that operation. When the number is increased to fifteen or twenty films the circumstances are decidedly different. But still the Watkins factorial method is available, and especially so. A film of six or twelve exposures is so apt to have wide variances in exposures that the older system of judging of development by inspection is found full of shortcomings. The factorial method, on the other hand, so long as one takes care to seize upon an average "first appearance" of the image among the six or twelve or to choose a sufficiently high factor for the very first appearance among them to guarantee contrast in those appearing later, passes judgment at once upon all the negatives in the film, and makes certain as uniformly good a result as can be obtained. With the use of such a formula for instance as Watkins' "thermo metol-quinol," (*) which, having three parts of hydroquinone to one of metol, would have a normal factor of about 12, one chooses instead a factor of say 15. He takes, then, the time of the first appearance of an image in any of the films, multiplies this by fifteen and takes the whole roll out at the expiration of the time represented thereby. It is to be remembered in this connection that greater contrast, within reason-

*Note—Mr. Alfred Watkins gives this formula as follows: A, Hydroquinone, 90 grains; metol, 30 grains; soda sulphite, 2 ounces; water, to make 10 ounces. B, Soda carbonate, 2¾ ounces; water to make 10 ounces. Mr. Watkins advises one part of each of these, A and B, to six parts of water. This will develop in about five minutes. One part of each to two parts of water will develop in about two and a half minutes.



HOME PORTRAITURE. SIDNEY V. WEBB.

able limits, is to be obtained by longer development, and that nine out of every ten amateur photographers who present work want contrasty prints.

When the roll of twelve negatives of the quarter-plate or postcard size comes to hand its length is so great that one must have truly collossal arms to develop it by the usual running of it into and out of the tray, holding it with one end in each hand. Two alternatives present: Slice it in two in the middle and develop each half separately, or put the whole film into the tank. In the former case it is best to unroll the film only to the figure "7" on the cover paper, leaving the second half rolled up until needed to prevent fog. In the latter case the strength of the tank developer can be regulated to permit the film's being finished about the time that one, two or more other shorter films have been manipulated in the tray.



IN OLD MONTEREY. ROY HARRISON DANFORTH.

So far has been mentioned only the development of roll films, these constituting the major portion of the work that will come to the developer and printer. In the case of film-pack films, the film-pack tank is undeniably the best method of handling them, doubling the strength of the developer to half the time if time is at a premium. If, however, the tray system is used it will be found that the difficulty of handling these films is materially reduced if they are thoroughly soaked in a tray of clear water before being slid into the developer. When placed in the latter they can be more easily kept from matting together by laying every other film at right angles to its predecessor. If all of a dozen films are slipped into the developer within half a minute the factorial method, with the time taken of first appearance on the first negative inserted, may be employed. If a much longer time is used to get the films into the developer, those inserted later will develop more slowly and can then only be judged on inspection. It is wise to remember, by the way, that film-pack films for some reason develop much more slowly than roll films, one experimenter having figured that it takes them about twice as long. Due regard to the safety of the darkroom light must be had, therefore, when they are being handled in the tray.

In the case of plates the problem of developing them speedily and yet efficiently is an older one, except with the newer darkroom workers to whom plates are chiefly a matter of history. They cannot be worked satisfactorily several at a time in the tray, as the film-pack films can, but must be treated one at a time. Here, again, the tank is the first choice, and while it is doing its work unassisted, the operator may proceed with his other films.

It seems hardly necessary to mention formulæ here beyond the typical metol-quinol previously given, as each operator will probably already have hit upon the one that suits him best. Pyro has the disadvantage for the man who does a quantity of films of leaving the fingers and finger-nails in most unpresentable shape. With metol-quinol the difficulty is obviated. For those who cannot work with metol, ortol is an excellently working reagent, quick, certain and productive of a negative of good black color. It is, however, more expensive than either of the others. Pyro gives fine negatives in



TULIPS. ROY J. SAWYER.

the tank, but so, for that matter, do the others, and above all, glycin. The time ordinarily given for tank development at different temperatures may be increased ten or fifteen per cent with safety to secure the contrasty effects that seem to delight the amateurs

Speed is again a requirement when the negatives are developed, washed and dried and printing is in hand. The worker with any considerable number of prints to make will find daylight out of the question and an artificially-lighted printer

a necessity. Of these there are numerous varieties, but most of them have one fault from the standpoint of the worker for amateurs: They permit speed when numerous prints are to be taken from one negative, but not so noticeably so when the negative is to be changed for each print or couple of prints as amateur work almost exclusively demands. This question, too, will be chiefly a matter of individual decision. I have used with much satisfaction a light-tight box in one end of which was a 150-watt Tungsten incandescent, fronted by two parallel ground-glass plates, and these in turn by an opening into which slipped easily a 5 x 7 printing frame. The latter I equipped with yellow cardboard masks, the cut-out for different-sized negatives being in the corner of the card with suitable margin on the two outsides. Holding the open printing frame with the corner down where the cut-out comes, permits of dropping in first the negative and then the print and feeling comfortably sure that the opening is covered by both and that there will be an ample white margin on two sides. The margin on the other two sides is obtained by cutting away the unprinted portion of the paper after it is developed, washed and dried.

Using such a printer I find it both economical and handy, since amateurs usually present negatives running from post-card size down, and very seldom as large as 4 x 5 or larger, to buy paper by the gross in the 4 x 6 size. This, with most makes of papers, is but a trifle more expensive than the post-card size, yet allows a wider white margin around prints from the postcard size negatives. Again, by simply reversing the paper after a first print has been made it allows two prints to the piece from negatives smaller than the 2½ x 4¼ size. With the 150-watt Tungsten, and the printer described, I have been able to turn out five prints to the minute, about two seconds being needed to print therewith from a negative of ordinary density and ten seconds to change negative and paper for the next print. For the worker who needs to do more prints an hour than three hundred recourse must be had to one of the patented printers the market affords.

The use of contrasty paper almost consistently for all the work one has to do for amateurs will prevent many a dispute with customers. Artistic work, doubtless, requires one to



THE LONE BOATMAN. G. P. KIMBERLY.



THE DAUGHTER OF THE HOUSE. J. C. STRAUSS.

keep a stock of each variety of hardness of the paper employed, yet it will take but brief experience to teach that the amateur wants a contrasty print. He wants plenty of black and white in the faces, in the dresses, in the water, in the trees. In his own words, he wants "things to stand out." One amateur in about ten will have his artistic perception sufficiently keen to desire softer prints. When the operator has found this one-in-ten, let him proceed in future batches of work to satisfy him. Until he appears, however, the worker is indisputably safe in using the hard paper for practically every negative he turns out. The particular finish to be employed may be judged after a few trials. The semi-gloss seems to be largely in vogue, yet more often than occasionally the worker will find amateurs to whom the semi-matte or even the matte immediately appeals. Such a customer's friendship may often be permanently cemented by



MOTHER AND DAUGHTER. Clarissa Hovey.

giving him the dull finish in the future, especially so if other workers in the community have not thought of using other than the semi-gloss. The market offers at least one paper (Cyko), probably others, that has been treated by the manufacturer to a thin coat of emulsion on the reverse side that prevents its rolling up as it dries. Such a paper makes for a great saving in time in the final preparation of the prints for delivery.

Systems is a prime requisite in doing work for amateurs as in any other business, and each worker will probably hit, sooner or later, upon a suitable way of keeping track of his work. The films come in in rolls, preferably with an attached tag bearing a serial number, the customer's name and address, the date of delivery promised, the number of prints to be made from each negative that turns out well, and any other necessary memorandum. This tag should be kept with the negative in the darkroom and may well be pinned to the end of it as it comes out of the developer and goes through the fixing, washing and drying. If the writing on the tag is not in indelible pencil no harm will be done to the solutions. When the film is cut up for printing the separate negatives may all handily be dropped with the tag into an envelope bearing the same number as the tag. When the prints are made this same number may be jotted upon the back of each before they go into the developer, the negatives placed back in their envelope when all have been printed and the prints assembled also in this envelope by means of the number they bear when the final work upon them is concluded. This is a statement of the simplest principles of a system that can be devised. Modification and developments of it will suggest themselves to the individual worker.

Most persons who now take up this sort of work find the schedule of prices in their community well established. Usually there are cut-rate workers everywhere, to meet whose prices one may or may not decide. Not meeting them is usually no bar to obtaining plenty to do. The lowest prices one finds usually guarantee a respectably-sized compensation. The standard scale of charges locally always affords a substantial return. In one western city, for instance, five cents a print is charged for each print of postcard size and ten

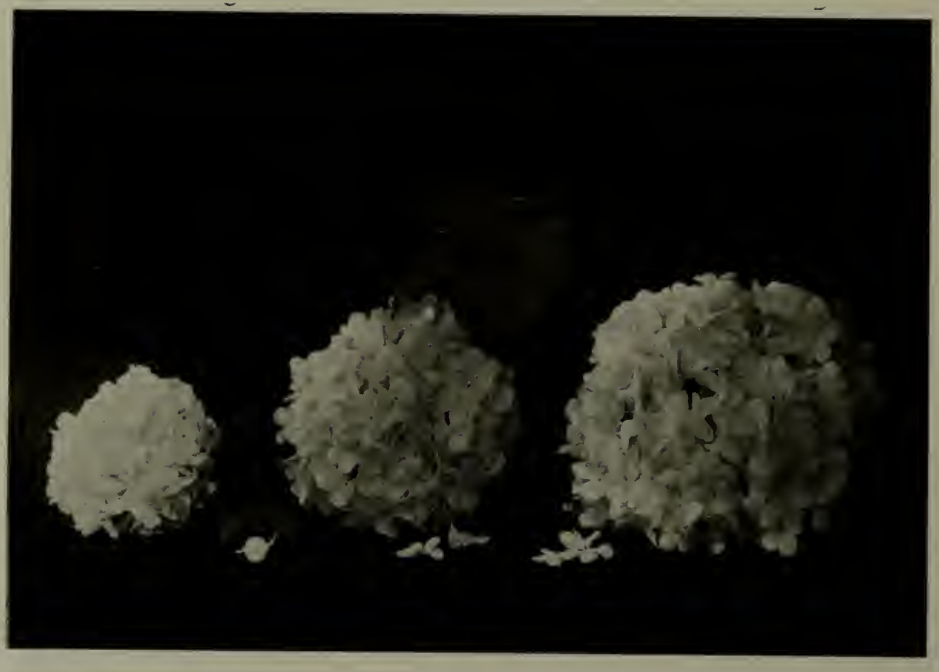
cents for developing a roll of six negatives. Since the cost of the former, including paper and chemicals, is probably less than a cent and a half a print and the cost of the latter not over that amount surely, the profit entailed is seen to be amply large. Moreover, the work may be done on any scale and be remunerative. Among his friends a worker will pick up many extra dollars in a summer. In his community, too, he will probably find without difficulty more than one dealer in photographic supplies who will gladly take in amateur work for him on a percentage basis with a fair margin of profit. I have known at least one amateur who paid for all the supplies he personally used by working among his friends and I know another who, though his regular occupation keeps him busy eight hours in the day, has added to his savings account many a dollar thus earned in a season.



TALKING. *Copyright, 1912, by D. J. Bordeaux.*



IN KENILWORTH CASTLE. V. SERIN.



SNOW BALLS. BESSIE W. THOMAS.

THE CARBON PROCESS AND A METHOD OF WORKING IT

By WILLIAM H. KUNZ

UPON talking over printing processes with a number of photographers it seems to be a rarity to find one who uses the one that for all around quality is far ahead of them all—carbon. The reason why it is not more generally used must be on account of a mistaken idea that the process is a difficult or expensive one, but as a matter of fact after a very little practice it is the simplest process of all. I have taught it to a number of people and have yet to find one who cannot master enough of the fundamental principles to be able to make a good carbon print inside of the first hour. If the method here described is followed good carbons are as simple as dark-room prints.

In order to fully understand the process it may be permissible to give an outline of the method of making the

pictures. In the first place the picture is printed on so called carbon tissue, which is simply a paper heavily coated with pigmented gelatine, which is sensitized by immersion in bichromate of potash. The action of light renders the gelatine insoluble wherever it strikes, but the light never penetrates deeply enough to go down to the paper support, hence there is a layer of soluble gelatine of varying thicknesses covering the entire support. In order to make a picture that will render all the tones of the negative the insoluble skin of gelatine on



COMPANIONS. JANE REECE.

the surface is transferred to a second support called the transfer paper, and the remaining soluble gelatine is washed off with warm water. The operations sound rather formidable, but as a matter of fact they are very simple mechanical operations and require no chemicals at all, and very little skill. We will take up the various operations in detail in the following paragraphs.

The materials required are inexpensive, and include carbon tissue, carbon transfer paper, flat scraper squeegee, proof paper, and bichromate of potash or bichromate of ammonium. The paper comes unsensitised and must be sensitised before

use, which is done by simply immersing the tissue in a solution of bichromate of a strength of about one ounce to a quart of water. Immerse the paper for three minutes, lay it face down on a sheet of glass, remove the surplus solution with the squeegee and hang the paper up to dry in a dark place. A good way to sensitize is to do it after dark and hang the paper up in a warm room, taking it down early in the morning. If the curtains are pulled down there will hardly be enough light get in to damage the tissue, as it is only slightly more sensitive than solio. The paper to work at its



A WINTER MORNING. GEORGE R. BOSWORTH.

best should dry in four hours or less, which it will do in a warmed room, especially in the winter time. The sensitized tissue will keep for several days if protected from the air. The easiest way to do this is to keep it under pressure in a printing frame in which you have put some black paper to protect it from the light.

The paper is printed about the same length of time that it would take to print a light solio proof from the same negative, one that will just show the detail wanted in the high lights. Note how long this takes and print the carbon the same time. In printing be sure that the edges of the negative are all covered by the rebates of the frame, or else by black paper.



PORTRAIT. Helmar Lerski.

This white margin forms a safe edge that protects the print from frilling when transferred. While the tissue is printing, or before if desired, some of the transfer paper can be put to soak in some luke warm water for a few minutes, ready to transfer the picture on to it. To make the transfer place the printed piece of tissue in a tray of cold water until it flattens out and just begins to curl back with the coated side out, then put a piece of the wetted transfer paper under it in the same tray, bringing them together under water so as to exclude air



RUSSET APPLES. NATHAN R. GRAVES.

bells. Draw the two pieces of paper out together and lay them on a piece of glass or other flat surface and remove the water from between them by scraping with the flat squeegee. It is usually safer to put a piece of oil cloth, or oiled paper, over the carbon paper to protect it from abrasion, and to start squeegeeing from the center of the print, working towards the edges. After the water has been removed by the squeegeeing the print is placed between dry blotters and under moderate pressure for about fifteen minutes, and it will be ready for development.

To develop the print, simply immerse it in warm water at



SON. EDWARD H. WESTON.

a temperature of from 90° to 100° until the soluble gelatine begins to ooze out from under the piece of tissue, strip off the tissue while both pieces of paper are kept under the surface of the water. Your picture is now supported by the transfer paper, and at this stage looks like a hopeless mass of melted gelatine. Rock the tray containing the print and the soluble gelatine will gradually wash off leaving the picture in all its details. If the picture is a little too dark, raise the temperature of the water, as high as 115° doing no harm. The higher the temperature the more will wash off and the lighter the print for a given exposure. After the picture is developed the bichromate left in the film is removed by placing the print for a few minutes in a solution of common alum of about three to five per cent and then washed to remove the alum. The print is now ready to hang up to dry.

There is considerable latitude in the degree of contrast that



SNOW. CHARLES E. WANLESS.

can be obtained by the carbon process, as the weaker the sensitizer the more contrast, and the stronger the sensitizer the less contrast. The sensitiveness varies in proportion to the strength of sensitizer used. In case still more contrast is desired, or a rather thin negative such as is used for developing paper is to be printed use the following sensitizer.

Water	32 Oz.
Bichromate Potash	½ Oz.
Citric Acid	10 grains.
Aqua Ammonia	20 minims.

This will give a rather slow printing, but very brilliant working tissue, and will give satisfactory prints from negatives that would otherwise be useless. To reduce the contrast for unduly harsh negatives use five per cent bichromate sensitizer and print them through a sheet of violet colored glass. An easy way to make such a glass is to fix out an old dry plate and stain it with any strong violet dye such as methyl violet or crystal violet. Printing through a yellow glass will also increase the contrast if necessary.

It is evident that considerable control is obtainable by washing down one part of the print more than another and also by washing one part with hotter water than the other, also if still more color is to be removed it can easily be done by carefully rubbing it off while developing, using a small piece of cotton in the form of a little tail which can be dragged over the part to be reduced. Care must be taken not to rub the print especially in the lighter parts as it is quite delicate, but the cotton will generally do all that is required. The shadows are much tougher and can be rubbed down with a wad of cotton without damage. Clouds can be worked in blank skies and lights and shades can be introduced wherever necessary without revealing their origin by taking advantage of the local development, thus putting a power in the user's hands that is very valuable. Another thing is that the absolute rendering of every tone gradation in the negative and the velvety shadows, give a quality that is almost impossible to obtain in any other process and certainly not by as easy a manipulation.



SUNFLOWERS. NATHAN R. GRAVES.

THE USEFUL NEGATIVE

By J. C. HEGARTY

IN the practice of photography the making of the negative is the vital part of the process, the quality of the finished print being determined largely by the quality of the negative, and it, therefore, behooves the earnest worker to get that class of negative which will yield the best results by the different processes of printing.

In the effort to make photographs that are different from the average, that convey an idea or give an impression to the beholder, many amateurs have tried to get effects in their negatives that border on the grotesque. They make prints that are unlike anything ever seen in nature and rival the effects of the enthusiastic painter of the impressionist school. Would it not be better to adopt a medium course?

The negatives that are made to give an unusual result are not always a success, and if they should be they are rarely amendable to manipulation and are useful to the one purpose only. On the contrary, a negative that would be called first class technically, in the hands of an experienced printer may be made to yield prints that differ very much in effect; they may be sharp in detail and of good contrast, record prints if you wish to use that term, or they may be soft and without an abundance of detail. The amateur has at his command



THREE OF A KIND. SAMUEL DORAN.

such a variety of papers that almost any effect may be secured, and he who confines himself to the use of but one kind of paper does not get the best from his negatives, and does not have that variety in his collection that would make it interesting.

The class of negative that will be most satisfactory in the printing room will be one that has been focused carefully, preferably with the sharp focus in the foreground or middle of the view so that the background may not be obtrusive, and a medium sized stop used in the lens that the negative may



ROSES. MARGARET L. BODINE.

have some atmosphere. Care should be used in developing in order to get all the half tones possible as well as some detail in the shadows, and to avoid violent contrasts.

We should, therefore, have a negative inclined to softness without strong contrasts and having plenty of detail that will give a fine print by direct printing on the different kinds of paper. If it is desired different effects may be produced by manipulation. Contrasts may be increased or diminished by selecting from the different grades of developing papers, and if detail is to be subdued a rough surfaced paper may be used and a broad effect secured. Those who desire impressionistic effects can print through bolting cloth, or thin sheets of

celluloid, and if a more subdued effect is desired prints may be made from the glass side of the negative.

Negatives of the class described are necessary for the production of the finest platinum prints as well as for the carbon process and first class enlargements can only be made from a technically perfect negative.

The negatives made with a soft focus lens have a place in our art science and if made by a careful worker who has artistic ability often yield beautiful results, but for the average amateur negatives as described will be most satisfactory.

The writer is not an advocate of any particular school but always endeavors to make a print that will give a pleasing representation of the scene, and it will be found that a good negative will be the first step in the production of such a print.



THE BREAKING WAVE. WILLIAM S. DAVIS.



BROTHER AND SISTER. Rudolf Dührkoop.

American Annual Formulary

In the following section we have gathered together a typical collection of Formulæ and Tables, which will assist the photographer in his every-day work. It will be noticed that makers' formulæ are omitted. These can best be obtained by direct application to the makers. The appended formulæ are selected from the working methods of practical photographers.—Editor.

TRAY DEVELOPERS FOR PLATES AND PAPERS

Amidol. A concentrated developer for plates.—Water, 13 ounces; sodium sulphite (crystals), 2½ ounces; when dissolved add amidol, ¼ ounce. The solution keeps fairly well in bottles completely full and well corked. For use take 1 ounce of the concentrated solution and dilute with 3 or 4 ounces of water.

Amidol. For gaslight papers.—An excellent developer for those subject to metol poisoning. (V. Serin.) Amidol, 60 grains; sodium sulphite crystals, 650 grains; potassium bromide, 10 grains; water, 20 ounces. Will keep only three or four days. Time of development about ½ minute.

Duratol-Hydroquinone—Universal Developer (M. D. Miller).—Hot water, 16 to 32 ounces; duratol, 15 grains. Dissolve and add, previously well mixed in the dry state, sodium sulphite, anhydrous, 440 grains; sodium carbonate, anhyrous, 660 grains. When dissolved, add hydroquinone, 60 grains. Add water to make 40 ounces. Use undiluted for contrasty gaslight papers. Dilute with an equal part of water for soft gaslight and bromide papers, plates, and films. For tank development at 65° Fahr. Dilute 1 to 1 and develop 12 to 15 minutes. Dilute 1 to 2 and develop 16 to 22 minutes. Dilute 1 to 3 and develop 26 to 34 minutes. Developer without bromide gives blue-black tones; small quantities of bromide give pure black; larger amounts, warm blacks.

Edinol-Hydro—For Panchromatic Plates.—Water, 30 ounces; edinol, 120 grains; hydroquinone, 120 grains; sodium sulphite (dry), 768 grains; carbonate potassium, 1344 grains; 10 per cent. bromide potassium solution, 1 dram; 10 per cent. oxalic acid solution, 1 dram. For tank use 1 ounce of above to 15 ounces water; temperature, 65 degrees; time, 15 minutes. For tray use 1 ounce above to 4 ounces water.

Edinol-Hydro Developer—For Plates and Papers (W. S. Davis).—Water, 8 ounces; edinol, 10 grains; hydrochinon, 15 grains; sodium sulphite (dry), 100 grains; sodium carbonate (dry), 150 grains. May be used full strength for gaslight paper, also for plates and bromide paper if desired. (Normal time of development at 60-65 degrees Fahr. Two minutes for plates.) Time of development is increased in proportion to amount of water added.

Eikonogen.—An excellent developer for under-exposed portrait negatives. (B. H. Allbee.) Eikonogen, 125 grains; sulphite of soda (dry), 125 grains; carbonate of soda (dry), 125 grains; bromide of potassium, 2 grains; water, 10 ounces. For softer effects add up to an equal volume of water. The image appears quickly and builds up fast.

Glycin-Metol—For Plates (*M. D. Miller*).—Water, 20 ounces; metol, 60 grains; sodium sulphite, anhydrous, 240 grains; sodium carbonate, anhydrous, 440 grains; glycin, 120 grains. Dilute with an equal volume of water. Wash plate thoroughly before fixing to prevent indelible yellow stain.

Hydrochinon.—For over-exposure plates to obtain contrasty negatives (B. H. Allbee). No. 1, water, 8 ounces; sodium sulphite (dry), ½ ounce; hydrochinon, 80 grains. No. 2, water, 8 ounces; sodium carbonate (dry), 1 ounce; potassium bromide, 40 grains. Take equal parts of No. 1 and No. 2. Temperature, 70 degrees.

Metol-Hydro-Eiko—For Double-coated Ortho Plates (*H. S. Hood*).—Water, 15 ounces; metol, 24 grains; hydroquinone, 24 grains; eikonogen, 24 grains; sodium sulphite (dry), ½ grain; sodium carbonate (dry), 320 grains; potassium bromide (10 per cent. solution), 4 drops.

Metol-Hydro-Eikonogen—For Plates (*Hood*).—Water, 150 ounces; metol, ½ ounce; hydroquinone, ½ ounce; sodium sulphite (dry), 5½ ounces; sodium carbonate (dry), 6 ounces. This can be kept in a hard rubber tank for five days before exhausted by oxidation.

Pyro—For Plates (*J. D. Elliott*).—Sulphite soda, 40° solution, 4 ounces; carbonate soda, 20° solution, 4 ounces; pyro, 10 grains.

Pyro—For Overtimed Plates (*J. D. Elliott*).—Sulphite soda, 40° solution, 4 ounces; water, 4 ounces; pyro, 10 grains. Immerse plates in this solution for 20 minutes in the dark; then add to above solution ½ drachm carbonate soda, 20° solution. When image appears add one more drachm of the carbonate soda solution.

Pyro-Metol—For Plates (*H. M. Long*).

A—Water, 22½ ounces; metabisulphite, 2 drams; metol, 60 grains; pyro, 1 ounce. B—Water, 16 ounces; sulphite of soda, 2 ounces. C—Water, 16 ounces; carbonate of soda, 1 ounce. Normally used 1 ounce of each stock to 16 of water.

Pyro Soda—For Plates (*Mellen*). No. 1.—Water, 20 ounces; sodium sulphite (crystals), 4 ounces; carbonate of soda, 2 ounces. Dissolve the sulphite first and then add the carbonate.

No. 2.—Water, 6 ounces; pyro, 1 ounce. For correct exposures take 1 dram of No. 2; 1 ounce of No. 1, and add 2 ounces of water. For snapshots, or plates thought to be under-exposed, use 1 dram of No. 2; 1½ drams of No. 1, and 6 ounces of water. For over-exposure take 2 drams of No. 2, 1 ounce of No. 1 and 6 ounces of water. Or, instead of the 2 drams of No. 2 in this solution use 1 dram of No. 2 and 10 drops of a 10 per cent. solution of potassium bromide.

TANK DEVELOPERS FOR NEGATIVES

Glycin (*Montgomery*). Water (hot), 8 ounces; sulphite of soda (anhydrous), 50 grains; carbonate of soda (anhydrous), 240 grains; glycin, 45 grains. For use take 3 ounces of above and 37 ounces water; temperature, 65 degrees; time, 25 minutes.

Metol-Hydro (*Frew*). Water, 12 ounces; metol, 7½ grains; sulphite of soda (anhydrous), 274 grains; hydroquinone, 30 grains; carbonate of soda (anhydrous), 150 grains; bromide of potassium, 2 grains. For use to each ounce of above add 4 ounces of water; temperature, 65 degrees; time, 12 minutes.

Ortol (*Smith*). Water, 60 ounces; metabisulphite of potassium, 15 grains; sulphite of soda (anhydrous), 100 grains; carbonate of soda (anhydrous), 100 grains; ortol, 30 grains; temperature, 65 degrees; time, 20 minutes.

Rodinal (*Agfa*). Water, 60 ounces; rodinal, 1 ounce; temperature, 65 degrees; time, 25 minutes.

DEVELOPERS FOR LANTERN SLIDES

Hydroquinone (*B. H. Allbee*).—No. 1.—Hydroquinone, 150 grains; metabisulphite potash, 10 grains; bromide potassium, 50 grains; water, 20 ounces.

No. 2.—Sulphite soda (dry), 1 ounce; caustic soda, 100 grains; water, 20 ounces. Take equal parts of No. 1 and No. 2.

Hydroquinone—For Colder Tones (*B. H. Allbee*). No. 1.—Hydroquinone, 60 grains; sulphite soda (dry), 1 ounce; citric acid, 10 grains; bromide potassium, 10 grains; water, 10 ounces.

No. 2.—Carbonate soda (dry), 1 ounce; water, 10 ounces. Use equal parts.

FIXING BATHS AND HARDENERS

Acid Fixing Bath (*Carbutt*).—Sulphuric acid, 1 dram; sodium hyposulphite, 16 ounces; sodium sulphite, 2 ounces; chrome alum, 1 ounce; warm water, 64 ounces. To prepare the bath, dissolve the hypo in 48 ounces of water; the sodium sulphite in 6 ounces; mix the sulphuric acid with 2 ounces of the water and pour slowly into the sulphite solution, and then add to the hypo solution. Dissolve the chrome alum in 8 ounces of water; add to the bulk of the solution and the bath is ready for use.

Acid Fixing Bath (*M. D. Miller*).—Hypo, 8 ounces; water, 1 quart; Lumiere's sodium bisulphite lye, 1 to 2 ounces, to which may be added, if greater hardening is desired, powdered alum, 220 grains.

Fixing Bath for Lantern Slides (*B. H. Allbee*).—Sulphuric acid, 1 dram; hypo, 16 ounces; sulphite soda (dry), 1 ounce; chrome alum, 1 ounce; water, 64 ounces.

Hardener for Fixing Bath (*Beach*). Water, 40 ounces; sulphite soda (crystals), 6 ounces; powdered alum, 16 ounces; acetic acid, 40 ounces. Add in the order given and shake well until dissolved. Of the above add 16 ounces to each gallon of hyposulphite of soda solution, testing 70 to 80 degrees.

Hardening Negatives.—Immerse them for a few minutes in formalin, 1 ounce; water, 30 ounces.

INTENSIFICATION

Intensifier, One Solution (*F. M. Steadman*). No. 1.—Bichloride of mercury, ½ ounce; water, 10 ounces. No. 2.—Iodide of potassium, 5 drams; water, 1½ ounces. Add to No. 1. No. 3.—Hyposulphite of soda, 1 ounce; water, 2½ ounces. Add to the previous mixture. This clears the solution when it is ready for use for local intensification. For tray intensification add more water to slow its action.

Intensifying with Red Ink (*E. M. Cohen*). Soak the negative well. Put teaspoon of red ink into tray of water and rock until mixed. Immerse negatives face up till well and evenly colored, then without washing put in drying frame. If left in solution too long will be over dense, in which case several trays of clear water will eliminate some of the color.

The intensification is permanent without the danger of negative going bad, as is the case when mercury is used.

Intensifier—Mercuric Chloride Process. No. 1.—Mercuric chloride, 200 grains; bromide of potassium, 120 grains; water, 6½ ounces.

No. 2.—Sodium sulphite, 1 ounce; water, 4 ounces. The well-washed negative, free from hypo, must be thoroughly bleached in No. 1; well washed; and then blackened in No. 2. After blackening it is well washed again.

REDUCTION

Reducer, Single Solution (F. M. Steadman).—Red prussiate of potash, size of pea; hyposulphite of soda, six times that volume; water, 6 ounces (for local reduction 1½ ounces). When reduced wash thoroughly.

Reducer—Ammonium Persulphate.—Ammonium persulphate, 15 grains; water, 1 ounce. The solution should be made just before use. The negative must be perfectly free from hypo or it will be stained by the persulphate. When the desired reduction has been reached, transfer the negative without washing to a 10 per cent. solution of anhydrous sodium sulphite. Wash finally for 15 or 20 minutes.

Reducer—Farmer's.—Dissolve 1 ounce of potassium ferricyanide in 9 ounces of water and make up to 10 ounces, forming a 10 per cent. solution. Label this poison. Thoroughly wet the negative to be reduced. Take enough fresh plain hypo fixing bath for the purpose, and add to it enough of the ferricyanide solution to make it a light straw color. The negative to be reduced is immersed in this solution, when it will be seen to lose density. Rock the tray to insure evenness of action. This reducer can also be used for local treatment.

PRINTING PROCESSES

Blue Prints.

Blue Printing Sensitizing Formulæ (Brown). A.—Dissolve 110 grains ferric ammonium citrate (green) in 1 ounce of water.

B.—Dissolve 40 grains of potassium ferricyanide in 1 ounce of water. These two solutions are made up separately. They are then mixed together and kept in a stoneware bottle, but the single solution should always be filtered before use. The mixture will retain its good qualities for months if kept from the light.

(*Millen*).—Potassium ferricyanide, 1 ounce; ammonio-citrate of iron, 1½ ounces; distilled water, 10 ounces. Mix thoroughly and filter. The solution should have a deep wine color and dry on the paper a lemon-yellow. If the solution is green and has a precipitate, the ammonio-citrate is old and spoiled. The mixture should be kept from the light.

Bromide Paper.

Bromide Paper Developers: Hydroquinone-metol. No. 1.—Water, 10 ounces; hydroquinone, 52 grains; potassium metabisulphite, 18 grains; sodium sulphite, 5 drams; sodium carbonate, 1¼ ounces.

No. 2.—Water, 10 ounces; metol, 30 grains; sodium carbonate, 5 drams; sodium sulphite, 5 drams. One or two drops of a potassium bromide 10 per cent. solution added to 1 ounce of the mixed developer will increase contrast and keep the whites pure. Equal parts of 1 and 2 give excellent prints from a normal negative; one part of 1 and two of 2 give gray prints with maximum half-tone and gradation; two parts of 1 and one of 2 give vigorous prints from soft delicate negatives.

Amidol for rich blacks (freshly prepared). Distilled (or boiled) water, 4 ounces; sodium sulphite (crystals), 90 drams; amidol, 10 to 15 grains. Add a drop of 10 per cent. bromide solution to each ounce of developer.

Sepia Tones: Hypo Alum.—Hyposulphite of soda, 5 ounces; ground alum, 1 ounce; boiling water, 70 ounces. Dissolve the hypo in the water, and then add the alum slowly. A milk-white solution results which should be decanted when clear. It is not used until cold (about 60° Fahr.).

Sepia Tones: Sulphide of Sodium.—The fixed and washed print is treated with one of the following solutions: (1) Potassium ferricyanide, 10 grains; potassium bromide, 10 grains; water, 1 ounce; or

(2) potassium ferricyanide, 20 grains; sodium chloride (common salt), 30 grains; water, 1 ounce. The image will be bleached by either of these solutions in a few minutes, the whitish appearance of the deposit being caused by its change into a salt of silver. After 5 minutes in running water apply the sulphuretting solution: Dissolve 3 ounces of sodium monosulphide in 15 ounces of water; boil the solution for about 10 minutes, filter off the black precipitate formed, and when cooled make up to 25 ounces with water. To tone, take 12 per cent. stock sodium sulphide solution, 1 ounce of water, 12 to 20 ounces.

Red Tones: Copper.—Dissolve 100 grains of ammonium carbonate in 2 ounces of water, and in this solution dissolve 10 grains of sulphate of copper. Then add 20 grains of potassium ferricyanide. A clear, dark green solution results which gives a red-chalk tone in about 3 minutes. Tone until the deepest shadow is converted, and then wash the print for 10 minutes.

Green Tones: Vanadium.—Bleach print in the following: Potassium ferricyanide, 10 grains; ammonium carbonate, 100 grains; water, 1 ounce. Wash well and apply: Ferric chloride, 2 grains; vanadium chloride, 2 grains; ammonium chloride, 4 grains; hydrochloric acid, 5 minims; water, 1 ounce.

Blue Tones: Iron.—Bleach print in: Potassium ferricyanide, 10 grains; ammonium carbonate, 100 grains; water, 1 ounce; then tone in ferric chloride, 5 grains; hydrochloric acid, 5 minims; water, 1 ounce.

To prevent blistering on bromide paper (*P. L. Anderson*).—Immerse after fixing and before washing from 10 to 15 minutes in water, 10 ounces: formaldehyde, 1 ounce. A 10 per cent. solution of chrome alum will do equally well.

To make bromide paper translucent (*P. L. Anderson*).—Lay the paper negative face down on a blotter and paint thinly with the following mixture. Give three coats. Turpentine, 3 ounces; powdered resin, 1 ounce; gum elemi, 1 ounce; paraffine wax, ½ ounce. Heat with stirring until it begins to boil. Allow to cool slightly and add turpentine, 3 ounces.

Carbon Tissue.

Carbon Tissue, Sensitizer for (*Bennett*).—Potassium bichromate, 4 drams; citric acid, 1 dram; strong ammonia water, about 3 drams; water, 25 ounces; dissolve the bichromate and citric acid in hot water, and add sufficient ammonia to change the orange color of the solution to lemon-yellow. Sensitize for 90 seconds; reducing the water softens the gradation in the print; increasing it to 30 ounces gives more vigor.

Carbon Lantern Slides.—Prepare the glass by coating with the following preparation: 180 grains of Nelson's Gelatine No. 1, in 20 ounces water. Add 10 grains bichromate of potash. Dry and allow the plate to be exposed to light for a couple of days to make the coating thoroughly insoluble. Sensitizer for tissue: 1 per cent. to 1¼ per cent. solution of bichromate of potash. Immerse 2 minutes. Print deeply; expose twice as long as ordinary paper print. Develop in hot water as usual.

Gum Bichromate.

Gum Bichromate (*Caspar Millar*). A.—Gum arabic, 1¼ ounces; water, 3½ ounces; salicylic acid, 4 grains.

B.—Chrome alum, 45 grains; water, 3½ ounces. Grind A and B with water and pigment, brush over paper, dry and store.

Suggested formula.—A, 2 ounces; B, 1½ drams; carbon black, 10 grains; sensitize for 2 minutes in 5 per cent. bichromate solution.

Kallitype.

Kallitype Sensitizer for Black Tones (*J. Thomson*).—Distilled water, 1 ounce; ferric oxalate (Merck's or Mallinckrodt's) 15 grains; citrate of iron and ammonia (brown scales), 25 grains; chloride of copper, 8 grains; oxalate of potassium, 35 grains; oxalic acid, 15 grains; silver nitrate, 15 grains; gum arabic, 10 grains. For greater contrast add 1 to 10 drops 5 per cent. bichromate of potassium solution.

Developer: Stock Solution.—Distilled water, 1 ounce; silver nitrate, 40 grains; citric acid, 10 grains; oxalic acid, 10 grains. Filter. Normal developer 1 dram stock solution and 7 drams of water.

Platinum Papers.

Platinum Sensitizer (*P. L. Anderson*).—No. 1. Oxalic acid, 16 grains; ferric oxalate, 240 grains; distilled water (hot), 16 drams; oxalic acid, 16 grains. No. 2. Ferric oxalate, 240 grains; potassium chlorate, 4 grains; distilled water (hot), 16 drams. No. 3. Potassium chloroplatinite, 219 grains; distilled water, 19 drams. For use take No. 1, 14 mm.; No. 2, 8 mm.; No. 3, 28 mm.

Platinum: Sensitizing Gold Bath and Sepia Papers. A.—Chloroplatinite of potassium, 15 grains; distilled water, 90 minims.

B.—Ferric oxalate, 21 grains; oxalic acid, 2 grains; distilled water, 183 minims. For cold bath paper, mix A and B, and add 15 minims of water. For sepia paper mix A and B and add 15 minims of a 5 per cent. solution of mercuric chloride. The addition of a few grains of potassium chlorate to any of the above gives increased contrast in the print. From 140 to 170 minims of solution are sufficient to coat a sheet of paper 20 x 26 inches.

Platinum Prints: to Intensify. A.—Sodium formate, 45 grains; water, 1 ounce.

B.—Platinum perchloride, 10 grains; water, 1 ounce.

C.—For use, take 15 minims each of A and B to 2 ounces of water. Immerse prints until sufficiently intensified, then remove and wash.

Platinum Prints to Distinguish from Bromide.—Soak the print in saturated solution of mercuric chloride; a platinum print will not change; a bromide print will bleach.

Salted Papers.

Salted Paper Prints: Sensitized with the following:—Silver, 480 grains Troy; water, 11 ounces. Dissolve and pour off 2 ounces, and to the 9 ounces left add strong aqua ammonia to form a precipitate and redissolve the precipitate, then add the remaining 2 ounces which will form another precipitate, to this add 9 drops of nitric acid C. P. Apply this to the paper with a tuft of cotton.

Any good Toning Bath will give good results, such as: Chloride Aluminum, 80 grains; bi-carbonate soda, 360 grains; water, 48 ounces. When mixed this will form a flocky hydrate which will settle to the bottom. It can be strained through clean washed muslin. To prepare a small bath for toning, take 12 ounces of the stock solution and add sufficient gold to tone in 8 to 10 minutes. The gold solution must be neutralized with bi-carbonate soda before adding to the above bath. When the prints reach the desired tone throw them into a bath of salt water, made of water, 1 gallon; table salt, 1 ounce.

Printing Out Papers.

Gold Toning (*B. H. Allbee*). No. 1, 10 per cent. solution sulphocyanide of potassium; No. 2, 15 grains chloride of gold in 7½ ounces of water; No. 3, 10 per cent. solution phosphate of soda; No. 4,

saturated solution borax. Take No. 1, 1 dram, water, 8 drams; No. 2, 4 drams; No. 3, 1 dram; No. 4, 2 drams. In this put print in dry. Toning should be complete in two minutes. Wash as usual.

MISCELLANEA

Adhesive for Labels.—Soak 1 part of the best glue in water until thoroughly swollen, add a little sugar candy, 1 part of gum arabic and 6 parts of water. Boil with constant stirring over a spirit lamp until the whole gets thin. Coat sheets of paper with it; let dry and cut up into convenient sizes.

Backing Mixture.—Dissolve a 4-ounce stick of licorice in 8 ounces of water with the aid of gentle heat. When dissolved rub into the mixture 1 ounce of burnt sienna in powder, using the back of a spoon for this purpose. When cold, bottle for use.

Blackening Brass.—Make two solutions: Copper nitrate, 200 grains; water, 1 ounce. Silver nitrate, 200 grains; water, 1 ounce. Mix the solutions; clean the article well; dip it in the solution for a moment; withdraw it; dry it; and heat it strongly.

Black, Dead, for Wood.—Shellac, 40 parts; borax, 20 parts; glycerine, 20 parts; water, 500 parts. When dissolved, add 50 parts aniline black.

Cleaning Greasy Bottles.—Wash with benzine, or permanganate of potassium, to which has been added some hydrochloric acid.

Bottles that have contained resinous substances, wash with potash or soda and rinse with alcohol. Bottles that have contained essences, wash with sulphuric acid, then with water.

Film: to Remove from Glass: Make two solutions. A.—Sodium fluoride, 6 grains; water, 4 ounces.

B.—Sulphuric acid, 6 drops; water, 1 ounce. Place the negative in solution A for 2 minutes and then place directly in solution B. After another 2 minutes lift the film with the finger from one corner of the plate. It will soon leave the glass.

Firelight Effects on Developing Paper (H. S. Hood). No. 1.—Water, 5 drams; copper sulphate, 10 per cent. solution, 15 minims; ammonium carbonate, 10 per cent. solution. Add till precipitate first formed is redissolved.

No. 2.—Water, 4½ ounces; potassium ferricyanide, 6/10 drams. Mix separately and add No. 2 to No. 1. The print will turn bright red. Wash well.

Ground Glass Varnish: Sandarac, 90 grains; mastic, 20 grains; ether, 2 ounces. Dissolve the resins in the ether and add benzole ½ to 1½ ounces.

Lens: to Clean.—The lens should always be kept free from dust or other impurities. To clean it, spread upon a table a clean sheet of paper; take the lens apart, and with a camel-hair brush dust each of the combinations on both sides. If the surfaces of the lenses are very dirty and have lost their polish, make up the following: Nitric acid, 3 drops; alcohol, 1 ounce; distilled water, 2 ounces. Dip a tuft of filtering cotton in this solution, rub each side of the lens, then polish with an absolutely clean chamois. Clean the lens tube before replacing the lenses, each of which should be finally dusted with a camel-hair brush.

Moonlight Effects on Developing Paper (H. S. Hood).—Immerse in water, 5 ounces; ferric ammonium citrate, 12 grains; potassium ferricyanide, 12 grains; nitric acid, 2/5 drams. Points will assume a blue color. Wash until whites become clear.

Mounting Without Cockling (W. S. Davis).—Coat back of dry print with as strong a solution of warm gelatine (pure table gelatine will do)

as can be spread easily. Allow to dry, then attach to mount by dampening the mount with water, then lay print in desired position; cover with a sheet of bond or smooth paper, and apply a warm flat iron until the gelatine melts. Very effective for thin mounting material, as there is no cockling if the mount contains just the right amount of water when the iron is applied.

Non-Abrasion Soda Mixture (*M. G. Lovelace*).—Sodium sulphite, 1 ounce; sodium carbonate, 370 grains; hypo, 8 grains. A mixture in these proportions may be used in place of sodas for paper; or sodium carbonate, 28.75 grams; hypo, 38.75 grams; water to 500.00 cc.

Poisons and Antidotes.—Administer the antidote as soon as possible. If a strong acid or alkali, or cyanide of potassium, has been swallowed, lukewarm water in large quantities should be swallowed at once. Where strong acids or alkalies have not been swallowed, rid the stomach of the poison by vomiting; for this purpose take 25 grains of zinc sulphate in warm water.

Polished surfaces: to Photograph.—Smear the surface with soft putty so as to deaden the reflections. Photograph the article against a black background, and stop off all reflections, allowing the light to come from one direction only. To photograph hollow cut glassware fill with ink or aniline black water dye. Before photographing machinery deaden the bright parts with putty.

Safe Light for Panchromatic Plates.—Take old dry plates and coat with the following: Water, 10 ounces; tartrazine, 75 grains; patent blue A, 75 grains; naphthol greens, 75 grains; sulphuric acid, 30 minims. Stain the plates as deeply as possible. Use two plates.

Stains: to Remove from the Hands.—Developer stains: solution of citric or oxalic acid. Silver nitrate stains: Water, 4 ounces; chloride of lime, 350 grains; sulphate of soda, 1 ounce. Apply with a brush.

Tarnished Daguerreotypes, to Restore.—Remove the silvered plate from the case and place it, image uppermost, under a box lid or other protector from dust, etc. Put a small piece of potassium cyanide into a graduate and pour over it 1 or 2 ounces of water. Hold the daguerreotype by the corner with a pair of pliers, rinse it in clear running water, then pour over it the weak cyanide solution (a 3 per cent. solution is usually employed), and return it to the graduate. Repeat this operation several times until the discoloration quite disappears. Wash well in running water, and then, before the surplus water has time to collect in tears upon the image, begin to dry the plate gradually over a spirit lamp, holding the plate in an inclined position so that it will dry from the uppermost corner. The secret of success is in the use of pure water for the final washings and the drying of the image without check or the formation of tears.

Test for Hypo: Potassium permanganate, 2 grains; potassium carbonate, 20 grains; distilled water, 40 ounces. Soak the plate or print to be treated in water for one hour, then remove and add to the water a few drops of the above solution, which will turn a greenish yellow or brown if the water is not free from hypo.

Varnish for Negatives and Lantern Slides.—Dissolve 1 part of gum sandarac in 25 parts of benzole. Apply cold.

Protective Varnish for Labels.—Use waterproof ink when writing on the paper. Dry and coat with the following varnish: Cut into fine shreds an old celluloid negative film from which all traces of gelatine have been removed. Put the shreds in a small bottle; half fill with amyl acetate and then add wood alcohol or methylated spirit which will dissolve the celluloid.

Waxing Solution: Spirits of turpentine, 6 ounces; Japan drier (white), 4½ ounces. Sprinkle the fluid on the print and rub in with cheesecloth.

THE ELEMENTS:
THEIR NAMES, SYMBOLS, AND ATOMIC WEIGHTS OXYGEN STANDARD.

Compiled by HENRY F. RAESS.

Aluminum	Al	27.10	Gold	Au	197.20	Radium	Rd	226.40
Amarillium	?	?	Helium	He	3.96	Rhodium	Rh	102.90
Antimony	Sb	120.20	Holmium	Ho	163.50	Rubidium	Rb	85.45
Argon	A	39.88	Hydrogen	H	1.008	Ruthenium	Ru	101.70
Arsenic	As	74.96	Indium	In	114.80	Samarium	Sm	150.40
Barium	Ba	137.37	Iodine	I	126.92	Scandium	Sc	44.10
Bismuth	Bi	208.00	Iridium	Ir	193.10	Selenium	Se	79.20
Boron	B	11.00	Iron	Fe	55.84	Silicon	Si	28.30
Bromine	Br	79.92	Krypton	Kr	82.92	Silver	Ag	106.88
Cadmium	Cd	114.40	Lanthanum	La	139.00	Sodium	Na	23.00
Caesium	Cs	132.81	Lead	Pb	207.10	Strontium	Sr	87.63
Calcium	Ca	40.07	Lithium	Li	6.94	Sulphur	S	32.07
Canadium	?	?	Lutecium	Lu	174.00	Tantalum	Ta	181.50
Carbon	C	12.00	Magnesium	Mg	24.32	Tellurium	Te	127.50
Cerium	Ce	140.25	Manganese	Mn	54.93	Terbium	Tb	159.20
Chlorine	Cl	35.46	Mercury	Hg	200.60	Thallium	Tl	204.00
Chromium	Cr	52.00	Molybdenum	Mo	96.00	Thorium	Th	232.40
Cobalt	Co	58.97	Neodymium	Nd	144.30	Thulium	Tm	168.50
Columbium	Cb	93.50	Neon	Ne	20.20	Tin	Sn	119.00
Copper	Cu	63.57	Nickel	Ni	58.68	Titanium	Ti	48.10
?	Ct	176.00	Niton	Nt	222.40	Tungsten	W	184.00
Dysprosium	Dy	162.50	Nitrogen	N	14.01	Uranium	U	238.50
Erbium	Er	167.70	Osmium	Os	190.90	Vanadium	V	51.00
Europium	Eu	152.00	Oxygen	O	16.00	Xenon	Xe	130.20
Fluorine	F	19.00	Palladium	Pd	106.70	Ytterbium	Yb	172.00
Gadolinium	Gd	157.30	Phosphorus	P	31.04	Yttrium	Yt	89.00
Gallium	Ga	69.90	Platinum	Pt	195.20	Zinc	Zn	65.37
Germanium	Ge	72.50	Potassium	K	39.10	Zirconium	Zr	90.60
Glucinum	Gl	9.10	Praseodymium	Pr	140.60			

TABLE OF COMPARATIVE PLATE SPEED NUMBERS.

H & D	Watkins P No.	Wynne F No.	H & D	Watkins P No.	Wynne F No.
10	15	24	220	323	114
20	30	28	240	352	120
40	60	49	260	382	124
80	120	69	280	412	129
100	147	77	300	441	134
120	176	84	320	470	138
140	206	91	340	500	142
160	235	103	380	558	150
200	294	109	400	588	154

The above Watkins and Wynne numbers are equivalent to the H and D, only when the latter is determined in accordance with the directions of Hurter and Driffield, that is with pyro-soda developer and using the straight portion only of the density curve.

To convert H and D into Watkins: Multiply H and D by 50 and divide by 34. For all practical purposes the Watkins P number is 1½ times H and D.

To convert Watkins into Wynne F Nos.: Extract the square root and multiply by 6.4.

The above methods have been approved by the Watkins Meter Company and the Infallible Exposure Meter Company.

TABLE OF SOLUBILITIES OF THE MORE COMMON CHEMICALS USED IN PHOTOGRAPHY

Sol.—Soluble. V.S.—Very Soluble. S.S.—Slightly Soluble.
Dec.—Decomposed. Insol.—Insoluble.

	One Part is soluble in—Parts of Water	
	Cold	Hot
Acetone, Sulphite	1	..
Acid, Citric	0.75	0.50
Acid, Gallic	100	0.3
Acid, Oxalic	9	0.3
Acid, Pyrogallic	2	V.S.
Acid, Tannic	0.6	..
Acid, Tartaric	0.75	.5
Alum	8	.25
Alum, Chrome	6	Dec.
Aluminum, Chloride	0.25	V.S.
Amidol	4	V.S.
Ammonium, Bichromate	5	.25
Ammonium, Bromide	1.3	0.7
Ammonium, Carbonate	4	Dec.
Ammonium, Citrate	0.5	V.S.
Ammonium, Iodide	0.75	V.S.
Ammonium, Nitrate	1	V.S.
Ammonium, Persulphate	1.5	Dec.
Ammonium, Sulphocyanide	0.6	V.S.
Borax	12.5	2
Cadmium, Bromide	1	V.S.
Cadmium, Chloride	0.7	V.S.
Cadmium, Iodide	1	.75
Caustic Potash—Pot. Hydrate	0.5	.25
Caustic Soda—Soda Hydrate	1.5	.5
Copper, Chloride	1	.75
Copper, Sulphate	3	1
Edinol	1	5
Gold, Chloride	V.S.	V.S.
Hydroquinone	17	..
Ferric, Chloride	0.75	.5
Ferric, Amm. Citrate	4	..
Ferric, Potassium Oxalate	15	0.85
Ferric, Sodium Oxalate	1.69	0.55
Ferrous, Sulphate	1.5	.05
Ferrous, Oxalate	Insol.	..
Lead, Acetate	2	1
Lead, Nitrate	2	.7
Mercury, Bichloride	18	2
Metol	Sol.	..

	One Part is Soluble in—Parts of Water	
	Cold	Hot
Ortol	Sol.	..
Potassium, Bicarbonate	3.5	Dec.
Potassium, Bichromate	10	1
Potassium, Bromide	1.5	1
Potassium, Carbonate	.9	0.50
Potassium, Chloroplatinite	6	V.S.
Potassium, Cyanide	1	0.5
Potassium, Ferricyanide	2.5	1.3
Potassium, Ferrocyanide	3	1.5
Potassium, Iodide	0.75	0.5
Potassium, Metabisulphite	Sol.	Dec.
Potassium, Oxalate	3	2
Potassium, Permanganate	16	10
Potassium, Persulphate	50	Dec.
Potassium, Sulphocyanide	1	0.5
Pyrocatechin	1.25	V.S.
Rochelle Salt	1.5	V.S.
Silver, Nitrate	.75	.25
Sodium, Acetate	3	.5
Sodium, Bicarbonate	12	Dec.
Sodium, Bisulphite	V.S.	..
Sodium, Bromide	1.25	1
Sodium, Carbonate (dry)	6	2.2
Sodium, Carbonate (crys't)	1.5	V.S.
Sodium, Chloride	3	2.5
Sodium, Citrate	1	.5
Sodium, Hyposulphite	1.5	1
Sodium, Iodide	.5	.3
Sodium, Phosphate	6.7	1
Sodium, Sulphide	V.S.	V.S.
Sodium, Sulphite (dry)	4	2
Sodium, Sulphite (crys't)	2.2	1
Sodium, Tungstate	8–12	S.
Uranium, Chloride	V.S.	V.S.
Uranium, Nitrate	.5	.25
Uranium, Sulphate	.5	.25

TABLES OF DISTANCES AT AND BEYOND WHICH ALL OBJECTS ARE IN FOCUS WHEN SHARP FOCUS IS SECURED ON INFINITY

Focal length of Lens in inches	Ratio marked on Stops													
	f/4	*f*/5.6	*f*/6	*f*/7	*f*/8	*f*/10	*f*/11	*f*/15	*f*/16	*f*/20	*f*/22	*f*/32	*f*/44	*f*/6
	Number of feet after which all is in focus													
4	33	24	22	19	17	13	12	9	8	7	6	4	3	2
4 ¼	38	27	25	21	19	15	14	10	10	7	7	5	3 ½	2 ½
4 ½	42	30	28	24	21	17	15	11	11	8 ½	7 ½	5 ½	4	3
4 ¾	47	34	31	27	24	19	17	12	12	9 ½	8 ½	6	5	3
5	52	36	35	30	26	21	19	14	13	10 ½	9 ½	6 ½	5 ½	3 ½
5 ¼	57	40	38	33	28	23	21	15	14	11 ½	10 ½	7	5 ½	3 ½
5 ½	63	45	43	36	31	25	23	17	15	12 ½	11 ½	7 ½	6	4
5 ¾	68	50	46	38	34	27	25	18	17	13 ½	13	8 ½	6 ½	4
6	75	54	50	42	38	30	28	20	19	15	14	9	7	4 ½
6 ¼	81	58	54	46	40	32	29	22	20	16	15	10	7 ½	5
6 ½	87	62	58	50	44	35	32	23	22	17 ½	16	11	8	5 ½
6 ¾	94	67	63	54	47	38	34	25	24	19	17	12	8 ½	6
7	101	72	68	58	51	40	37	27	25	20	18	12 ½	9	6
7 ¼	109	78	73	62	54	44	39	29	27	22	20	13 ½	10	6 ½
7 ½	117	83	78	64	58	47	42	31	29	24	21	14 ½	10 ½	7
7 ¾	124	90	83	71	62	50	45	33	31	25	22	15 ½	11	7 ½
8	132	96	88	76	68	52	48	36	32	28	24	16	12	8
8 ¼	141	100	94	80	71	56	51	37	35	29	25	17 ½	12 ½	8 ½
8 ½	150	104	100	84	76	60	56	40	38	30	27	19	13 ½	9
8 ¾	156	111	104	89	78	63	57	42	39	32	29	20	14	10
9	168	120	112	96	84	67	61	45	42	34	31	21	15	10 ½
9 ¼	180	127	116	101	90	71	65	47	45	35	32	22	16	11
9 ½	190	133	125	107	95	75	68	50	47	37	34	24	17	12
9 ¾	197	141	131	113	99	79	72	52	50	39	36	25	18	12 ½
10	208	148	140	120	104	83	75	55	52	42	38	26	19	13

If sharp focus is secured on any of the distances shown, then, with the stop indicated all objects are in focus from half the distance focused on up to infinity.

LENGTH OF STUDIO

REQUIRED FOR LENSES OF DIFFERENT FOCAL LENGTHS FROM 6 TO 8 FEET IS ALLOWED FOR THE CAMERA AND OPERATOR

From "Photographic Lenses" by BECK and ANDREWS

Focus of Lens	Size	Kind of Portrait	Length of Studio	Dist. of Lens from Object
Inches			In Feet	In Feet
6	Carte de Visite 3 ¼x4 ¼	Full Length	18 to 20	11 to 12
7 ½	Carte de Visite	Full Length	22 to 25	14 to 15
8 ½	Carte de Visite	Full Length	24 to 28	17 to 19
		Bust	10 to 15	5
9 ½	Cabinet and smaller groups	Full Length	20 to 23	12 to 13
		Bust	12 to 17	7
11	Cabinet and 5x7 groups	Full Length	25 to 30	17 to 18
		Bust	13 to 20	8
14 ½	Cabinets, panels and 6 ½x8 ½ groups	Full Length	32 to 40	23 to 24
		Bust	14 to 20	7
19	10x12 portraits or groups	Full Length	20 to 25	13
		Bust	14 to 20	7
24	16x20 portraits or groups	Full Length	25 to 30	14
		Bust	14 to 20	8

TABLE FOR CALCULATING DISTANCES IN ENLARGING OR REDUCING

From The British Journal Photographic Almanac

Focus of Lens — Inches	Times of Enlargement and Reduction							
	1 Inch	2 Inches	3 Inches	4 Inches	5 Inches	6 Inches	7 Inches	8 Inches
2.....	4 4	6 3	8 2⅔	10 2½	12 2⅖	14 2⅓	16 2²⁄₇	18 2¼
2½.....	5 5	7½ 3¾	10 3⅓	12½ 3⅛	15 3	17½ 2⁹⁄₁₀	20 2⁶⁄₇	22½ 2³⁄₁₆
3.....	6 6	9 4½	12 4	15 3¾	18 3⅗	21 3½	24 3³⁄₇	27 3³⁄₈
3½.....	7 7	10½ 5¼	14 4⅔	17½ 4¾	21 4⅕	24½ 4¹⁄₁₂	28 4	31½ 3⁹⁄₁₀
4.....	8 8	12 6	16 5⅓	20 5	24 4⅘	28 4⅔	32 4⁴⁄₇	36 4½
4½.....	9 9	13½ 6¾	18 6	22½ 5⅗	27 5⅖	31½ 5¼	36 5¹⁄₇	40½ 5¹⁄₁₆
5.....	10 10	15 7½	20 6⅔	25 6¼	30 6	35 5⅚	40 5⁵⁄₇	45 5⅜
5½.....	11 11	16½ 8¼	22 7⅓	27½ 6⅘	33 6½	38½ 6⁵⁄₁₂	44 6²⁄₇	49½ 6³⁄₁₆
6.....	12 12	18 9	24 8	30 7½	36 7⅕	42 7	48 6⁶⁄₇	54 6¾
7.....	14 14	21 10½	28 9⅓	35 8¾	42 8²⁄₅	49 8⅙	56 8	63 7⅞
8.....	16 16	24 12	32 10⅔	40 10	48 9⅗	56 9⅓	64 9¹⁄₇	72 9
9.....	18 18	27 13½	36 12	45 11¼	54 10⅘	63 10½	72 10²⁄₇	81 10⅛

The object of this table is to enable any manipulator who is about to enlarge (or reduce) a copy any given number of times to do so without troublesome calculation, It is assumed that the photographer knows exactly what the focus of his lens is, and that he is able to measure accurately from its optical center. The use of the table will be seen from the following illustration: A photographer has a *carte* to enlarge to four times its size. and the lens he intends employing is one of 6 inches equivalent focus. He must therefore look for 4 on the upper horizontal line and for 6 on the first vertical column and carry his eye to where these two join, which will be 30-7½. The greater of these is the distance the sensitive plate must be from the center of the lens; and the lesser, the distance of the picture to be copied. To *reduce* a picture any given number of times, the same method must be followed; but in this case the greater number will represent the distance between the lens and the picture to be copied, the latter that between the lens and the sensitive plate. This explanation will be sufficient for every case of enlargement or reduction.

If the focus of the lens be 12 inches, as this number is not in the column of focal lengths, look out for 6 in this column and multiply by 2, and so on with any other numbers.

THE REFLECTING POWER OF VARIOUS SURFACES

ACCORDING TO MAX FRANK

Translated by Henry F. Raess

Mirror	0.923	The moon	0.170
Freshly fallen snow	0.783	Light red	0.162
White paper	0.700	Dark green	0.101
Light orange paper	0.548	Dark earth	0.079
Light green paper	0.465	Dark blue	0.065
Light yellow paper	0.400	Black paper	0.045
Light blue paper	0.300	Black cloth	0.012
White sandstone	0.237	Black velvet	0.004
Dark yellow	0.200		

STRENGTH OF VARIOUS LIGHTS, ACCORDING TO EDER

COMPILED BY HENRY F. RAESS

Sun at zenith	100.000–160.000
Flaming arc light	2000–3000
Electric arc light	400–1000 and higher
Nernst projection lamp, 220 volts	1000
" " " 110 "	500
Mercury vapor lamp	300–400
Electric incandescent light, metallic filament	25–50
Electric incandescent light, carbon filament	8–32 and higher
Magnesium ribbon burning 0.0074 gm. (about 1-10 grain) per second	125
Calcium light, low pressure	23–90
" " high " 52 lbs	790
Acetylene gas light	60–100
" " " with compressed air	100–400
Incandescent gas light	60–85
" " " with compressed air	100–400
Gas flame, argand burner	16–20
" " fish tail jet	6–10
Oil lamp	10–11
" " with oxygen	60
Petroleum lamp, round burner, 25 m-m (1 in.) diam	14
Petroleum lamp, round burner, 15 m-m (about 1-2 in.) diam	6.5
Petroleum lamp, flat burner	5–7
Normal paraffine candle	1
Tallow candle	0.7–0.9
Full moon	0.333–0.166

UNITED STATES WEIGHTS AND MEASURES
According to Existing Standards

LINEAR

	Inches	Feet	Yards	Rods	Fur's	Mi.
12 inches = 1 foot.	12 =	1				
3 feet = 1 yard.	36 =	3 =	1			
5.5 yards = 1 rod.	198 =	16.5 =	5.5 =	1		
40 rods = 1 furlong.	7,920 =	660 =	220 =	40 =	1	
8 furlongs = 1 mile.	63,360 =	5,280 =	1,760 =	320 =	8 =	1

SURFACE—LAND

	Feet	Yards	Rods	Roods	Acres
144 sq. ins. = 1 sq. ft.					
9 sq. ft. = 1 sq. yard.	9 =	1			
30.25 sq. yds. = 1 sq. rod.	272.25 =	30.25 =	1		
40 sq. rods = 1 sq. rood.	10,890 =	1,210 =	40 =	1	
4 sq. roods = 1 acre.	43,560 =	4,840 =	160 =	4 =	1
640 acres = 1 sq. mile.	27,878,400 =	3,097,600 =	102,400 =	2,560 =	640

VOLUME—LIQUID

4 gills = 1 pint.
2 pints = 1 quart.
4 quarts = 1 gallon.

Gills	Pints	Gallon	Cub. In.
32 =	8 =	1 =	231

FLUID

Gallon	Pints	Ounces	Drachms	Minims	Cubic Centimetres
1 =	8 =	128 =	1,024 =	61,440 =	3,785,435
	1 =	16 =	128 =	7,680 =	473,179
		1 =	8 =	480 =	29,574
			1 =	60 =	3,697

16 ounces, or a pint, is sometimes called a fluid pound.

TROY WEIGHT

Pound	Ounces	Pennyweights	Grains	Grams
1 =	12 =	240 =	5,760 =	373.24
	1 =	20 =	480 =	31.10
		1 =	24 =	1.56

APOTHECARIES' WEIGHT

lb.	℥	ʒ	℈	gr.	
Pound	Ounces	Drachms	Scruples	Grains	Grams
1 =	12 =	96 =	288 =	5,760 =	373.24
	1 =	8 =	24 =	480 =	31.10
		1 =	3 =	60 =	3.89
			1 =	20 =	1.30
				1 =	.06

The pou nd, ounce, and grain are the same as in Troy weight.

AVORDUPOIS WEIGHT

Pound	Ounces	Drachms	Grains (Troy)	Grams
1 =	16 =	256 =	7,000 =	453.60
	1 =	16 =	437.5 =	28.35
		1 =	27.34 =	1.77

ENGLISH WEIGHTS AND MEASURES

APOTHECARIES' WEIGHT

20 Grains	=	1 Scruple	=	20 Grains.
3 Scruples	=	1 Drachm	=	60 Grains.
8 Drachms	=	1 Ounce	=	480 Grains.
12 Ounces	=	1 Pound	=	5,760 Grains.

FLUID MEASURE

60 Minims	=	1 Fluid Drachm
8 Drachms	=	1 Fluid Ounce
20 Ounces	=	1 Pint
8 Pints	=	1 Gallon

The above weights are usually adopted in formulas.

All Chemicals are usually sold by

AVOIRDUPOIS WEIGHT

27 11/32 Grains	=	1 Drachm	=	27 11/32 Grains
16 Drachms	=	1 Ounce	=	437 1/2 Grains
16 Ounces	=	1 Pound	=	7,000 Grains

Precious Metals are usually sold by

TROY WEIGHT

24 Grains	=	1 Pennyweight	=	24 Grains
20 Pennyweights	=	1 Ounce	=	480 Grains
12 Ounces	=	1 Pound	=	5,760 Grains

NOTE.—An ounce of metallic silver contains 480 grains, but an ounce of nitrate of silver contains only 437 1/2 grains.

UNITED STATES FLUID MEASURE

Gal.		Pints.		Ounces.		Drachms.		Mins.		Cub. In.		Grains.		Cub. C. M.
1	=	8	=	128	=	1,024	=	61,440	=	231.	=	58,328.886	=	3,785.44
		1	=	16	=	128	=	7,680	=	28.875	=	7,291.1107	=	473.18
				1	=	8	=	480	=	1.8047	=	455.6944	=	29.57
						1	=	60	=	0.2256	=	56.9618	=	3.70

IMPERIAL BRITISH FLUID MEASURE

Gal.		Pints.		Ounces.		Drachms.		Mins.		Cub. In.		Grains.		Cub. C. M.
1	=	8	=	160	=	1,280	=	76,800	=	277.27384	=	70,000	=	4,543.732
		1	=	20	=	160	=	9,600	=	34.65923	=	8,750	=	567.966
				1	=	8	=	480	=	1.73296	=	437.5	=	28.398
						1	=	60	=	0.21662	=	54.69	=	3.550

METRIC SYSTEM OF WEIGHTS AND MEASURES

MEASURES OF LENGTH

Denominations and Values		Equivalents in Use
Myriameter	10,000 meters.	6.2137 miles.
Kilometer	1,000 meters.	.62137 mile, or 3,280 ft. 10 ins.
Hectometer	100 meters.	328. feet and 1 inch.
Dekameter	10 meters.	393.7 inches.
Meter	1 meter.	39.37 inches.
Decimeter	1-10th of a meter.	3.937 inches.
Centimeter	1-100th of a meter.	.3937 inch.
Millimeter	1-1000th of a meter.	.0394 inch.

MEASURES OF SURFACE

Denominations and Values		Equivalents in Use
Hectare	10,000 square meters.	2.471 acres.
Are	100 square meters.	119.6 square yards.
Centare	1 square meter.	1,550. square inches.

MEASURES OF VOLUME

Denominations and Values			Equivalents in Use	
Names	No. of Liters	Cubic Measures	Dry Measure	Wine Measure
Kiloliter or stere	1,000	1 cubic meter.	1.308 cubic yards.	264.17 gallons.
Hectoliter	100	1-10th cubic meter.	2 bu. and 3.35 pecks.	26.417 gallons.
Dekaliter	10	10 cubic decimeters.	9.08 quarts.	2.6417 gallons.
Liter	1	1 cubic decimeter.	.908 quart.	1.0567 quarts.
Deciliter	1–10	1-10th cubic decimeter.	6.1023 cubic inches	.845 gill.
Centiliter	1–100	10 cubic centimeters.	.6102 cubic inch.	.338 fluid oz.
Milliliter	1–1000	1 cubic centimeter.	.061 cubic inch.	.27 fl. drm.

WEIGHTS

Denominations and Values			Equivalents in Use
Names	Number of Grams	Weight of Volume of Water at its Maximum Density	Avoirdupois Weight
Millier or Tonneau	1,000,000	1 cubic meter.	2204.6 pounds.
Quintal	100,000	1 hectoliter.	220.46 pounds.
Myriagram	10,000	10 liters.	22.046 pounds.
Kilogram or Kilo	1,000	1 liter.	2.2046 pounds.
Hectogram	100	1 deciliter.	3.5274 ounces.
Dekagram	10	10 cubic centimeters.	.3527 ounce.
Gram	1	1 cubic centimeter.	15.432 grains.
Decigram	1–10	1-10th of a cubic centimeter.	1.5432 grain.
Centigram	1–100	10 cubic millimeters.	.1543 grain.
Milligram	1–1000	1 cubic millimeter.	.0154 grain.

For measuring surfaces, the square dekameter is used under the term of ARE; the hectare, or 100 ares, is equal to about 2 ½ acres. *The unit of capacity* is the cubic decimeter or LITER, and the series of measures is formed in the same way as in the case of the table of lengths. The cubic meter is the unit of measure for solid bodies, and is termed STERE. *The unit of weight* is the GRAM, which is the weight of one cubic centimeter of pure water weighed in a vacuum at the temperature of 4 deg. Cent. or 39.2 deg. Fahr., which is about its temperature of maximum density. In practice, the term cubic centimeter, abbreviated c.c., is generally used instead of milliliter, and cubic meter instead of kiloliter.

THE CONVERSION OF FRENCH (METRIC) INTO ENGLISH MEASURE

1	cubic centimeter	=	17	minims						
2	cubic centimeters	=	34	"						
3	"	=	51	"						
4	"	=	68	"	or	1	dram	8	minims	
5	"	=	85	"	"	1	"	25	"	
6	"	=	101	"	"	1	"	41	"	
7	"	=	118	"	"	1	"	58	"	
8	"	=	135	"	"	2	drams	15	"	
9	"	=	152	"	"	2	"	32	"	
10	"	=	169	"	"	2	"	49	"	
20	"	=	338	"	"	5	"	38	"	
30	"	=	507	"	"	1	ounce	0	dram	27 minims
40	"	=	676	"	"	1	"	3	drams	16 "
50	"	=	845	"	"	1	"	6	"	5 "
60	"	=	1014	"	"	2	ounces	0	"	54 "
70	"	=	1183	"	"	2	"	3	"	43 "
80	"	=	1352	"	"	2	"	6	"	32 "
90	"	=	1521	"	"	3	"	1	"	21 "
100	"	=	1690	"	"	3	"	4	"	10 "
1000	"	=	1 liter = 34 fluid ounces nearly, or $2\frac{1}{8}$ pints.							

THE CONVERSION OF FRENCH (METRIC) INTO ENGLISH WEIGHT

The following table, which contains no error greater than one-tenth of a grain, will suffice for most practical purposes:

1	gram	=	15⅖	grains.					
2	grams	=	30⅘	"					
3	"	=	46⅕	"					
4	"	=	61⅘	"	or	1	dram	1⅘	grain
5	"	=	77⅕	"	"	1	"	17⅕	grains
6	"	=	92⅗	"	"	1	"	32⅗	"
7	"	=	108	"	"	1	"	48	"
8	"	=	123⅖	"	"	2	drams	3⅖	"
9	"	=	138⅘	"	"	2	"	18⅘	"
10	"	=	154⅖	"	"	2	"	34⅖	"
11	"	=	169⅘	"	"	2	"	49⅘	"
12	"	=	185⅕	"	"	3	"	5⅕	"
13	"	=	200⅗	"	"	3	"	20⅗	"
14	"	=	216	"	"	3	"	36	"
15	"	=	231⅖	"	"	3	"	51⅖	"
16	"	=	247	"	"	4	"	7	"
17	"	=	262⅖	"	"	4	"	22⅖	"
18	"	=	277⅘	"	"	4	"	37⅘	"
19	"	=	293⅕	"	"	4	"	53⅕	"
20	"	=	308⅗	"	"	5	"	8⅗	"
30	"	=	463	"	"	7	"	43	"
40	"	=	617⅕	"	"	10	"	17⅕	"
50	"	=	771⅗	"	"	12	"	51⅗	"
60	"	=	926	"	"	15	"	26	"
70	"	=	1080⅕	"	"	18	"	0⅕	"
80	"	=	1234⅗	"	"	20	"	34⅗	"
90	"	=	1389	"	"	23	"	9	"
100	"	=	1543⅕	"	"	25	"	43⅕	"
1000	"	=	1 kilogram = 32 oz., 1 dr., 12⅖ gr.						

"UNIFORM SYSTEM" NUMBERS FOR STOPS FROM $\frac{f}{1}$ TO $\frac{f}{100}$

In the following table Mr. S. A. Warburton calculated the exposure necessary with every stop from $\frac{f}{1}$ to $\frac{f}{100}$ compared with the unit stop of the "uniform system" of the Photographic Society of Great Britain. The figures which are underlined show in the first column what $\frac{f}{a}$ must be in order to increase the exposure in geometrical ratio from $\frac{f}{4}$, the intermediate numbers showing the uniform system number for any other aperture

f	U. S. No.	f	U. S. No.	f	U. S. No.
1	$\frac{1}{16}$	15	14.06	58	210.25
$1\frac{1}{4}$	.097	16	16	59	217.56
1.414	$\frac{1}{8}$	17	18.06	60	225.00
$1\frac{1}{2}$	.140	18	20.25	61	232.56
$1\frac{3}{4}$	.191	19	22.56	62	240.25
2	$\frac{1}{4}$	20	25.00	63	248.06
$2\frac{1}{4}$	.316	21	27.56	64	256
$2\frac{1}{2}$	.390	22	30.25	65	264.06
2.828	$\frac{1}{2}$	22.62	32	66	272.25
$2\frac{3}{4}$	.472	23	33.06	67	280.56
3	.562	24	36.00	68	289.00
$3\frac{1}{4}$	.660	25	39.06	69	297.56
$3\frac{1}{2}$	.765	26	42.25	70	306.25
$3\frac{3}{4}$	.878	27	45.56	71	15.06
4	1	28	49.00	72	324.00
$4\frac{1}{4}$	1.12	29	52.56	73	333.06
$4\frac{1}{2}$	1.26	30	56.25	74	342.25
$4\frac{3}{4}$	1.41	31	60.06	75	351.56
5	1.56	32	64	76	361.00
$5\frac{1}{4}$	1.72	33	68.06	77	370.56
$5\frac{1}{2}$	1.89	34	72.25	78	380.25
5.656	2	35	76.56	79	390.06
$5\frac{3}{4}$	2.06	36	81.00	80	400.00
6	2.25	37	85.56	81	410.06
$6\frac{1}{4}$	2.44	38	90.25	82	420.25
$6\frac{1}{2}$	2.64	39	95.06	83	430.56
$6\frac{3}{4}$	2.84	40	100.00	84	440.00
7	3.06	41	105.06	85	451.56
$7\frac{1}{4}$	3.28	42	110.25	86	462.25
$7\frac{1}{2}$	3.51	43	115.56	87	473.06
$7\frac{3}{4}$	3.75	44	121.00	88	484.00
8	4	45	126.56	89	495.06
$8\frac{1}{4}$	4.25	45.25	128	90	506.25
$8\frac{1}{2}$	4.51	46	132.25	90.50	512
$8\frac{3}{4}$	4.78	47	138.06	91	517.56
9	5.06	48	144.00	92	529.00
$9\frac{1}{4}$	5.34	49	150.06	93	540.56
$9\frac{1}{2}$	5.64	50	156.25	94	552.25
$9\frac{3}{4}$	5.94	51	162.56	95	564.06
10	6.25	52	169.00	96	576.00
11	7.56	53	175.56	97	588.06
11.31	8	54	182.25	98	600.25
12	9.00	55	189.06	99	612.56
13	10.56	56	196.00	100	625
14	12.25	57	203.06		

American Photographic Societies

This list is compiled from information received from an inquiry form sent to the societies during the latter half of 1913. It includes many societies not given in the 1913 list, but falls short of completeness as a record of the photographic societies of America. Secretaries of societies not here listed are urged to send us particulars of their organization so that the list may be fully representative of society activities.—Editor.

AKRON CAMERA CLUB—Akron, Ohio. Headquarters, Y. M. C. A. Building. Established 1890. Membership, 50. Date of meetings, second and fourth Monday of each month from October to May, inclusive. *President,* H. A. Hoffman; *Secretary,* A. S. Hibbs, 358 Dean Street. Date of annual exhibition, February.

AMERICAN FEDERATION OF PHOTOGRAPHIC SOCIETIES—Headquarters, Toledo Museum of Art, Toledo, Ohio. *President,* John F. Jones, 723 Ash Street, Toledo, Ohio; *Vice-President,* August Smith, Toledo, Ohio; *Treasurer,* George W. Beatty; *Secretary,* C. C. Taylor, 3223 Cambridge Avenue; *Historian,* William A. Rheinheimer.

AMERICAN INSTITUTE PHOTOGRAPHIC SECTION—New York City. Headquarters, 19-21 West 44th Street. Established March 26, 1859. Stated meetings, first and third Tuesdays of each month. No meetings during Summer months. *President,* Oscar G. Mason; *Vice-President,* Robert A. B. Dayton; *Treasurer,* James Y. Watkins; *Secretary,* John W. Bartlett, M.D., F.R.P.S., 149 West 94th Street.

AMERICAN LANTERN SLIDE INTERCHANGE—New York. Principal office, 361 Broadway. Organized 1885. *General Manager,* F. C. Beach. Membership, 20 clubs. *Board of Managers,* F. C. Beach, New York; H. W. Shonewolf, Buffalo, N. Y.; O. C. Reiter, Pittsburg, Pa.; Charles Townsend, Orange, N. J.; W. H. Rau, Philadelphia, Pa. Annual meeting, January of each year.

BALTIMORE CAMERA CLUB, INC.—Headquarters, 1121 Bolton Street, Baltimore, Md. Organized in April, 1912. *President,* Jas. Leslie Hays; *Vice-President,* Enoch M. Barker; *Secretary,* Geo. E. Kessell, 113 North Charles Street; *Treasurer,* John Douglas Wade. Meet every Friday night.

BOSTON CAMERA CLUB—Boston, Mass. Headquarters, 50 Bromfield Street. Established 1881. Incorporated 1886. Membership, 100. Date of meetings, first Mondays. *President,* P. Hubbard; *Secretary,* John H. Thurston, 50 Bromfield Street. Date of annual exhibition, Spring.

BOSTON PHOTO-CLAN—Boston, Mass. Organized July, 1911. Headquarters, The Garo Studio, 739 Boylston Street. Membership, 9. *Secretary,* Dr. Malcolm Dean Miller, 419 Boylston Street, Boston, Mass.

BOSTON YOUNG MEN'S CHRISTIAN UNION CAMERA CLUB—Boston, Mass. Headquarters, 48 Boylston Street, Boston. Organized 1908. *President,* Dr. H. D. Hutchins; *Vice-President,* Arthur Hammond; *Treasurer,* H. C. Channen; *Secretary,* M. L. Vincent. Meetings first Tuesday each month at club rooms, 48 Boylston Street.

BUFFALO CAMERA CLUB—Buffalo, N. Y. Headquarters, Block Building, corner Elmwood Avenue and Utica Street. Annual election of officers fourth Thursday in April; regular meeting nights, second and fourth Thursdays of each month. *President,* E. I. McPhail; *Vice-President,* Frank V. Lepper; *Secretary,* F. J. Lipprell, 795 Elmwood Avenue.

CALIFORNIA CAMERA CLUB—San Francisco, Cal. Headquarters, 833 Market Street, San Francisco. Established March 18, 1890. Incorporated April 5, 1890. Membership, 358. Date of meeting, second Tuesday, monthly. Date of annual exhibition, no set time. *President,* C. Willard Evans; *Secretary,* J. P. Zipf, 833 Market Street, San Francisco, Cal.

CAMERA CLUB—New York. Headquarters, 121 West 68th Street. Established by consolidation of Society of Amateur Photographers and New York Camera Club in April, 1896. Incorporated May 7, 1896. Membership, 200. Date of annual meeting, first Thursday after the first Monday in January. *Secretary,* Monroe W Tingley.

CAMERA CLUB OF CINCINNATI—Cincinnati, Ohio. Headquarters, 7th and Walnut Streets. Established February 26, 1913. Membership 42. Date of meetings, every Wednesday. *President,* Claude Davis Millar; *Treasurer,* Peter Scherrer; *Secretary,* Edward A. Todd.

CAMERA CLUB OF HARTFORD—Hartford, Conn. Membership, 25. *President,* Dr. Frederic S. Crossfield, 75 Pratt Street; *Vice-President,* Clayton P. Chamberlain; *Corresponding Secretary,* Eugene D. Field; *Treasurer,* A. L. Chase; *Secretary,* Mr. Charles R. Nason, 20 Madison Street.

CAMERA CLUB OF THE TWENTY-THIRD STREET BRANCH, Y. M. C. A.—New York. Headquarters, 23d Street Y. M. C. A. Established June 3, 1904. Membership, 65. Date of business meetings, second Tuesday in each month. *President,* Wm. J. Guy; *Acting Secretary,* Ernest A. Heckler, 215 West 23d Street; *Treasurer,* F. W. Grunwold. Date of annual exhibition, usually in January. No fixed date.

"CAMERADS"—New Brunswick, N. J. Headquarters, corner Church and George Streets. Established April 24, 1890. *Secretary,* Harvey Iredell, D.D.S., Lock Box 34, New Brunswick.

CAMERA CRAFT CLUB—Steubenville, Ohio. Established March 28, 1913. Regular meetings last Friday of each month. *President,* Miss Elinor J. Neidengard; *Vice-President,* Miss Margaret E. Fisher; *Secretary* and *Treasurer,* Charles E. McKee, 10 Wilson Avenue.

CAPITAL CAMERA CLUB—Washington, D. C. Headquarters, 1010 F Street, N. W. Established April, 1891. Date of meetings, second Friday in each month. *President,* Wm. T. Wade; *Vice-President,* Wm. Ullman; *Treasurer,* Louis Lowe; *Secretary,* R. D. Vail, 1010 F. Street, N. W.; *Librarian,* Geo. F. Cranston. Date of annual exhibition, May.

CHICAGO CAMERA CLUB—Chicago, Ill. Headquarters, 329 Plymouth Court. Established February 14, 1904. Incorporated February 19, 1904. Date of meetings, every Thursday. *President,* Fred H. Clutton; *Vice-President,* Dr. J. W. Cornell; *Secretary* and *Treasurer,* Harry F. Rich, 329 Plymouth Court.

CLEVELAND CAMERA CLUB—Cleveland, Ohio. Established June 7, 1913. Permanent organization to be effected at meeting of June 18. *Chairman,* Horace Carr; *Secretary* and *Treasurer,* A. D. Williams, P. O. Box 102.

COLUMBIA PHOTOGRAPHIC SOCIETY—Philadelphia, Pa. Headquarters, 2526 North Broad Street, Philadelphia. Established 1889. Incorporated July 3, 1894. Membership, 100. Date of meetings, first Monday of each month, business meeting; other Mondays, lectures or demonstrations. Date of annual exhibition, January, prints; November, lantern slides. *President,* H. J. Wiegner; *Vice-President,* G. C. Bird, M.D.; *Treasurer,* C. T. Davis; *Secretary,* C. C. Whitenack, 1944 N. Camac Street.

DAGUERRE CAMERA CLUB—Headquarters, Harbert, Mich. Established 1893. Membership, 20. Date of meetings, first Monday of each month. *President,* F. Blish; *Secretary,* Wells Sizer, Harbert.

ELMIRA CAMERA CLUB—Elmira, N. Y. Headquarters, 116 Baldwin Street, Elmira. Established 1902. Membership, 37. *President,* W. H. Arnold; *Secretary-Treasurer,* Seely Stage, 625 W. Gray Street.

ELYSIAN CAMERA CLUB—Hoboken, N. J. Headquarters, 307 Washington Street. Established 1902. Date of meetings, second Friday of each month. Membership, 50. *President,* Richard J. Reynolds; *Vice-President,* Albert Harrass; *Treasurer,* Julius Nelson; *Secretary,* Chas. Westerburg, 636 Park Avenue.

ESSEX CAMERA CLUB—Newark, N. J. Headquarters, 33 Court Street, Newark, N. J. Organized July, 1899. Membership, 80. Date of meetings, fourth Tuesday of every month. *President,* George A. Hardy; *Secretary,* L. F. Gebhardt, 233 South 11th Street. Date of annual exhibition, February.

GRAND RAPIDS CAMERA CLUB—Grand Rapids, Mich. Headquarters, 95-97 Monroe Avenue. Established 1899. Meetings every Thursday night from September to June. Annual exhibition in April. *President,* Dr. W. A. Rawson; *Vice-President,* H. M. Long; *Secretary-Treasurer,* Miss Fedora E. D. Brown, 230 Lagrave Avenue.

NEW HAVEN CAMERA CLUB—739 Chapel Street. Organized, 1911. Membership, 90. *President,* E. G. Wooster; *Vice-President,* R. H. Eno; *Secretary,* C. F. Boswell; *Treasurer,* H. D. Vincent. Meetings held every Thursday evening. Annual exhibition held at the Public Library, March or April.

INTERNATIONAL PHOTOGRAPHIC ASSOCIATION—San Francisco, Cal. Founded 1908. *President,* F. B. Hinman, Room 4, Union Depot, Denver, Colo.; *Chief Album Director,* J. H. Winchell, R. F. D. No. 2, Painesville, Ohio; *General Secretary,* Fayette J. Clute, 413-415 Call Building, San Francisco; *Stereoscopic Album Director,* James B. Warner, 413-415 Call Building, San Francisco, Cal.; *Director Post Card Division,* Charles M. Smythe, 1160 Detroit Street, Denver, Colo.; *Director Lantern Slide Division,* George E. Moulthrope, Bristol, Conn.; *Secretary Lantern Slide Division,* Edward F. Cowles, 11 Oak Street, Bristol, Conn. The *State Secretaries:* Alabama—Richard Hines, Jr., 155 State Street, Mobile. Alaska—P. S. Hunt, Valdez. California—Sigismund Blumann, 3159 Davis Street, Fruit-

vale, Cal. Colorado—O. E. Aultman, 106 East Main Street, Trinidad. Connecticut—George E. Moulthrope, Bristol. Florida—Capt. E. S. Coutant, U. S. Life-Saving Service, Oak Hill. Georgia—L. O. Surles, 231 East Pine Street, Atlanta. Idaho—Eugene Clifford, Weippe. Illinois—George A. Price, 1102 West Main Street, Urbana. Indiana—H. E. Bishop, 1704 College Avenue, Indianapolis. Iowa—C. E. Moore, Eddyville. Kansas—H. E. High, Box 72, Ellsworth. Maryland—E. G. Hopper, 218 East 20th Street, Baltimore. Massachusetts—John Mardon, 161 Summer Street, Boston. Michigan—W. E. Ziegenfuss, M.D., 327 West Hancock Avenue, Detroit. Minnesota—Leonard A. Williams, St. Cloud. Mississippi—George W. Askew, Jr., 211 34th Avenue, Meridan. Missouri—Wharton Schooler, R. F. D. No. 2, Eolia. Nebraska—Miss Lou P. Tillotson, 1305 South 32d Street, Omaha. New Hampshire—Mrs. A. Leonora Kellogg, 338 McGregor Street, Manchester. New York—Louis R. Murray, 266 Ford Street, Ogdensburg. New Jersey—Burton H. Albee, 103 Union Street, Hackensack. North Dakota—Jas. A. Van Kleeck, 619 Second Avenue, North Fargo. Ohio—J. H. Winchell, R. F. D. No. 2, Painesville. Pennsylvania—L. A. Sueary, 2822 Espy Avenue, Pittsburg, Pa. South Dakota—C. B. Bolles, L. B. 351, Aberdeen. Texas—J. B. Oheim, P. O. Drawer M, Henrietta. *Utah—John C. Swenson, A.B., Provo. West Virginia—Wm. E. Monroe, Box 298, Point Pleasant.

JAMESTOWN CAMERA CLUB—Jamestown, N. Y. Established 1907. Headquarters, Chadakoin Building, Jamestown, N. Y. Membership, 18. Meetings, second Tuesday of month. *President,* C. O. Hultgren; *Vice-President,* C. Southwick; *Treasurer,* E. H. Sample; *Secretary,* L. Miller, 108 Buffalo Street.

KANSAS CITY CAMERA CLUB—Kansas City, Mo. *President,* Dr. Maclay Lyon; *Vice-President,* Ben J. Lubschez; *Secretary-Treasurer,* E. G. Stephens.

LENS AND BRUSH CLUB—Northampton, Mass. Headquarters, Y. M. C. A. Building. Organized 1906. Meetings, second Thursday in month. Exhibition usually in early June. *President,* C. H. Sawyer; *Vice-President,* C. H. Howard; *Secretary,* C. Norman Fitts, 12 Bedford Terrace.

LOS ANGELES CAMERA CLUB—Los Angeles, Cal. Headquarters, 3d floor, 321 South Hill Street. Meet every Thursday at 8 p. m. Organized 1908. *President,* Geo. J. Smith; *Secretary,* T. K. Adlard, 1104 West 42d Street.

MISSOURI CAMERA CLUB—St. Louis, Mo. Club Rooms, Suite No. 26 and 27, Euclid Building. Organized November, 1903. Meetings, second and fourth Tuesday. *President,* Arnold D. Alt; *Treasurer,* Chas. Lindenschmit; *Secretary,* J. P. Edsall, 4940 Washington Boulevard.

MONTREAL AMATEUR ATHLETIC ASSOCIATION CAMERA CLUB—Montreal, Canada. Headquarters, M. A. A. A. Building, 250 Peel Street. Organized May 1, 1906. *President,* C. F. G. Johnson; *Vice-President,* B. B. Pinkerton; *Treasurer,* R. E. Melville; *Secretary,* P. F. Calcutt, Postal Station B, Box 93.

NEWARK CAMERA CLUB—59 Mechanic Street, Newark, N. J. Organized 1888. Incorporated 1910. *President,* F. Oscar Race; *Vice-President,* Alexander Berne; *Treasurer,* L. Wright, Jr.; *Secretary,* W. S. Norris, 85 Bleecker Street, Newark, N. J.

NEW BRITAIN CAMERA CLUB—Organized 1892. *President,* H. G. Voight; *Secretary,* E. A. Sheldon, 53 Lenox Place, New Britain, Conn. Meets second and fourth Tuesdays, 173 Main Street.

ORANGE CAMERA CLUB—Orange, N. J. Headquarters, 222 Main Street. Established March 21, 1892. Incorporated May 19, 1893. Membership, 100. Date of meetings, first and third Saturdays of each month, except July, August and September. *President,* R. F. Hetherington; *Secretary,* R. M. Crater, 222 Main Street, Orange, N. J.

OREGON CAMERA CLUB—Portland, Ore. Established 1895. Incorporated 1903. Headquarters, 207 Park Street. Membership, 150. Date of meetings, second Tuesday in January. *President,* C. T. Richardson; *Vice-President,* B. S. Durkee; *Secretary-Treasurer,* J. J. Tyrrell. Date of annual exhibition, early Spring.

PHOTOGRAPHIC CLUB OF BALTIMORE CITY—Baltimore, Md. Headquarters, Maryland Academy of Sciences Building, 105 West Franklin Street. Established 1885. Incorporated 1890. Membership—Active, 48; honorary, 9; associate, 4; non-resident, 1. Date of meetings, every Tuesday, 8:30 p. m. *President,* Lloyd D. Norris; *Secretary,* N. Wright Crowder, 3939 Frisby Street. Date of annual exhibition, February.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA—Philadelphia, Pa. Headquarters, 1722 Arch Street. Established November, 1862. Incorporated April 24, 1885. Membership, 140. Date of meetings, second and third Wednesday, 8 P. M. *President,* Dr. Henry Leffmann; *Secretary,* Harold F. A-Starr, 1722 Arch Street. Date of annual exhibition, February.

PHOTO CLUB OF ALAMEDA COUNTY—Oakland, Cal. Headquarters, 2423 Broadway. *President,* Sigismund Blumann; *Secretary,* Charles T. G. Smith.

PHOTO-PICTORIALISTS OF BUFFALO—Buffalo, N. Y. Organized October, 1906. Membership, 8. Meetings, semi-monthly. *Correspondent,* W. H. Porterfield, 100 Lakeview Avenue.

PHOTO-SECESSION—New York, N. Y. Headquarters and Galleries, 291 Fifth Avenue. Continuous exhibitions November-April. *Director,* Alfred Stieglitz.

PITTSBURG ACADEMY OF SCIENCE AND ART (PHOTOGRAPHIC SECTION)—Pittsburg, Pa. Headquarters, Carnegie Institute, Schenley Park. Organized January 23, 1900. Membership, 100. Meetings, second Tuesday of each month at Club Room, 5504 Penn Avenue, and fourth Tuesday of each month at Carnegie Institute. *President,* O. C. Reiter, 2424 Penn Avenue; *Vice-President,* Rev. David R. Breed; *Secretary-Treasurer,* F. L. Miller, 1113 Penna. Station; *Lantern Slide Director,* W. A. Dick, 910 Chislett Street; *Print Director,* S. A. Martin, 923 Chislett Street.

PITTSBURG CAMERA CLUB—Pittsburg, Pa. Established, December, 1910. Membership, 75. Headquarters, 233 Fifth Avenue. *President,* Robt. L. Sleeth, Jr.; *Treasurer,* Wm. McK. Ewart, 2524 Center Avenue; *Secretary,* Charles W. Doutt, Crafton, Penna.

PORTLAND CAMERA CLUB PHOTOGRAPHIC SECTION OF THE PORTLAND SOCIETY OF ART—Portland, Me. Headquarters, Spring corner High Street. Established 1899. Membership, 90. Date of meetings, every Monday evening. *President,* F. W. Shaw; *Vice-President,* H. A. Peabody; *Secretary,* E. Roy Monroe. Date of annual exhibition, in March.

POSTAL PHOTOGRAPHIC CLUB—Headquarters, Washington, D. C. Established December, 1888. Membership, 40. Date of meetings, no regular meeting. *President,* Charles E. Fairman; *Secretary,* Gustavus A. Brandt, 631 Maryland Avenue, S. W., Washington, D. C. Albums circulate among members monthly, except August and September.

PROVIDENCE CAMERA CLUB—Providence, R. I. Established 1883. Incorporated 1889. Headquarters, Commercial Bldg., 55 Eddy Street. Total membership, 100. Date of meetings, second Saturday of each month. *President,* H. Ladd Walford; *Vice-President,* Ernest F. Salisbury; *Secretary,* C. W. Morrill, 55 Eddy Street; *Treasurer,* G. Frederick Bohl.

ROCHESTER CAMERA CLUB—Rochester, N. Y. Headquarters, Wilder Arcade, Rochester, N. Y. *President,* W. B. Cline; *Vice-President,* D. C. Ward; *Treasurer,* S. P. Hines; *Secretary,* Chas. C. Zoller, 100 Delevan Street.

SALON CLUB—Members, 18. *Director,* W. H. Zerbe, 345 Spruce Street, Richmond Hill, L. I., N. Y.; *Secretaries,* W. and G. Parrish, 5607 Cobanne Avenue, St. Louis. Circulate monthly portfolios.

ST. LAWRENCE CAMERA CLUB—Ogdensburg, N. Y. Headquarters, 74 Caroline Street. Established 1900. Membership, 8. Date of meetings, at the call of the Secretary. *President,* Arthur L. Jameson; *Secretary,* John N. Brown, 74 Caroline Street.

TOLEDO CAMERA CLUB—Toledo, Ohio. Member of the American Federation. Headquarters, Museum of Art. Meets second Wednesday of month. *President,* W. A. Ward; *Vice-President,* John T. Murphy; *Secretary,* Harry Webb, 1019 Prouty Avenue; *Treasurer,* M. W. Chapin.

TORONTO CAMERA CLUB—Toronto, Canada. Established 1887. Incorporated 1893. Headquarters, 2 Gould Street. Membership, 216. Date of meetings, every Monday, from October to April, inclusive. *President,* Edwin Utley; *Secretary-Treasurer,* Edward Y. Spurr. Date of annual exhibition, March or April.

TOWN AND COUNTRY CAMERA CLUB—St. Paul, Minn. Established 1901. Date of meetings, every week, at which lectures and demonstrations are given pertaining to camera work. Outing excursions on May 30. *President,* George L. Nevis; *Secretary,* M. W. Wright, Kenyon, Minn. Exhibitions annually.

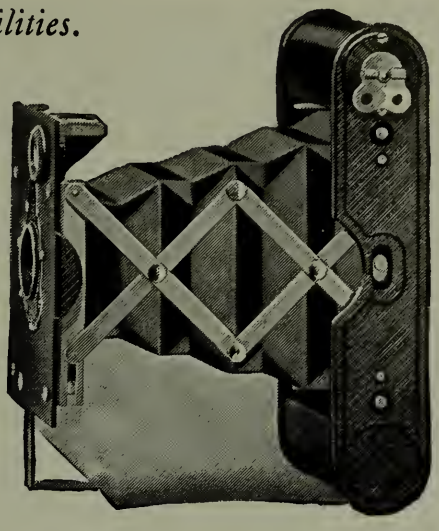
TRINIDAD CAMERA CLUB—Trinidad, Colo. Established April 21, 1906. Meetings second Wednesday of every month at O. E. Aultman's Studio. Monthly competitions. *President,* W. L. Crouch; *Vice-President,* J. Gysin; *Secretary* and *Treasurer,* W. Drearden, 532 Colorado Avenue.

WILKES-BARRE CAMERA CLUB—Wilkes-Barre, Pa. Rooms, Poli Building. Meets every Tuesday, 8 o'clock. *President,* H. C. Shepherd; *Secretary,* J. H. Prideaux, 171 Academy Street. Exhibition annually, in the spring.

WINNIPEG CAMERA CLUB—Enderton Building, Portege Avenue, Winnipeg, Manitoba, Canada. Organized February 29, 1902. Membership, 30. Meetings monthly at call of Secretary. Exhibition, second week in May. *President,* W. Rowe Lewis; *Secretary,* J. M. Iredale.

YONKERS CAMERA CLUB—Yonkers, N. Y. *President,* W. R. Cronk; *Vice-President,* Geo. J. Stengel; *Secretary,* Dr. Stewart Lee Jeffrey, 184 Warburton Avenue.

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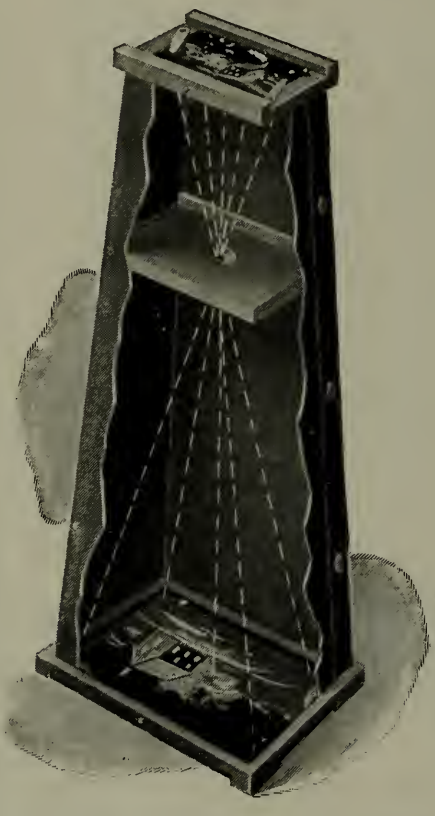
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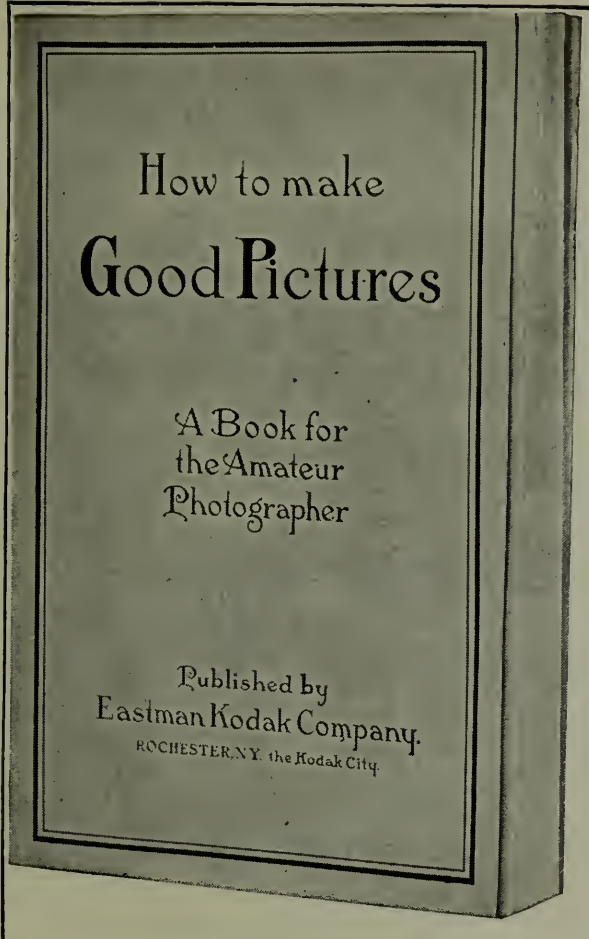
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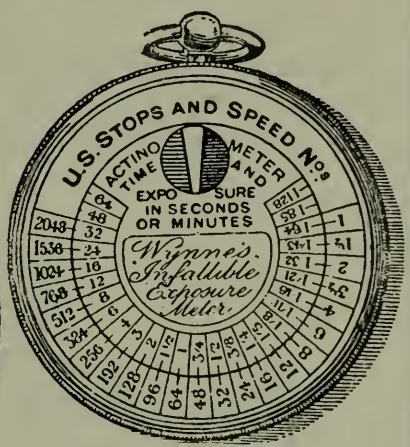
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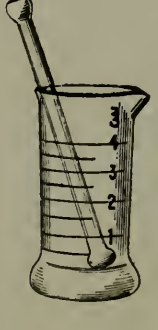
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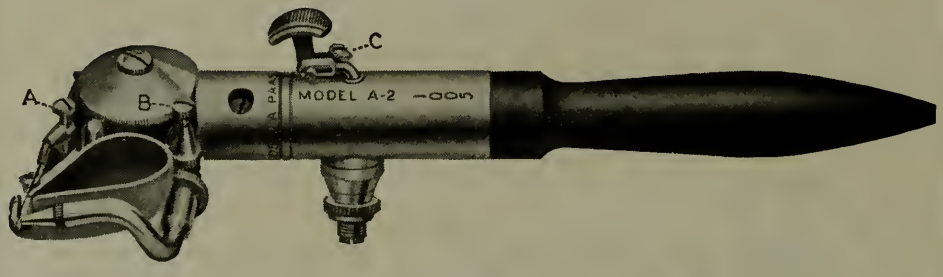
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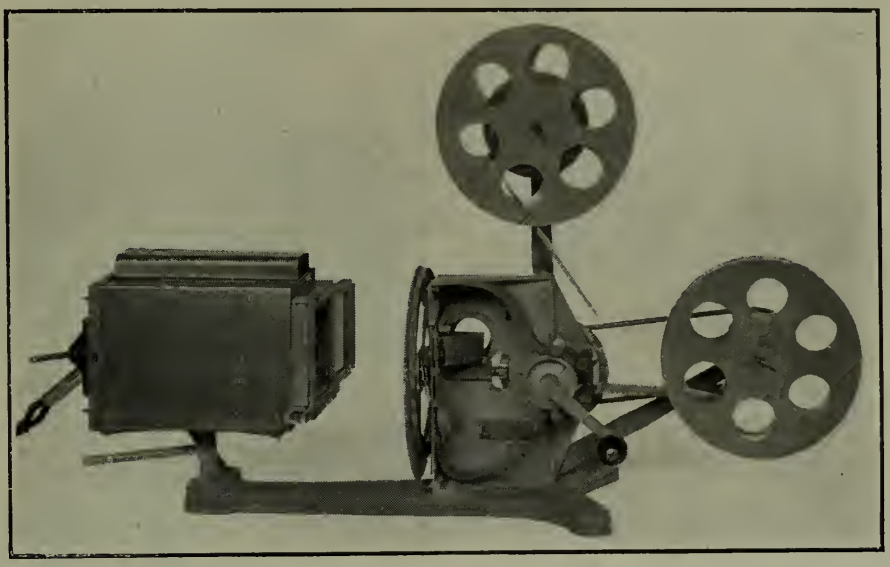
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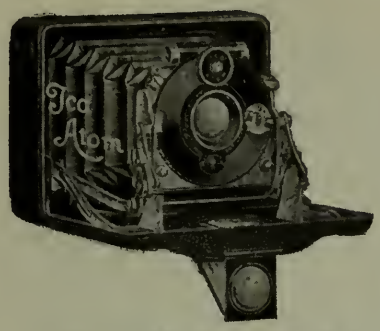
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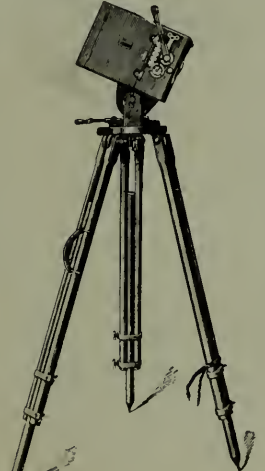
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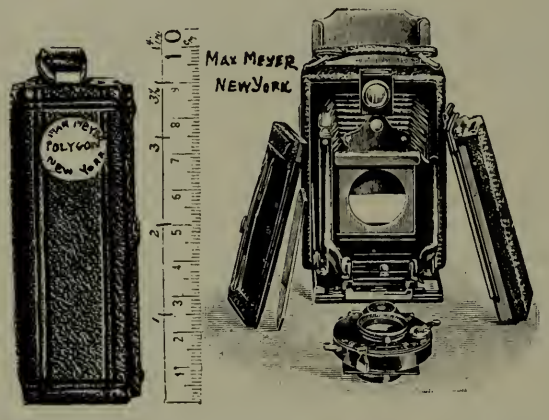
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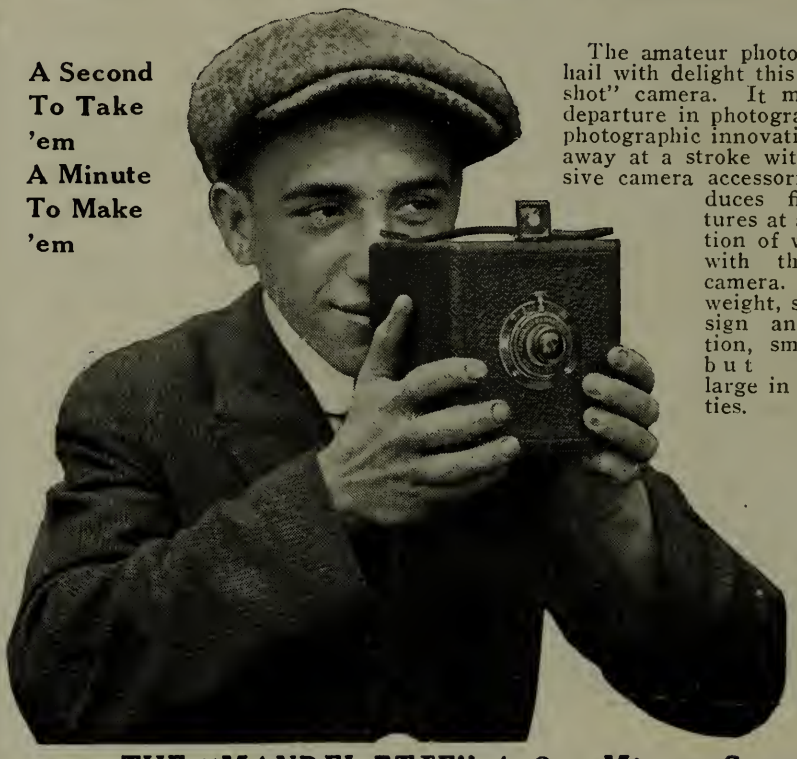
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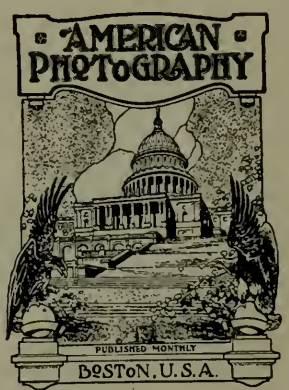
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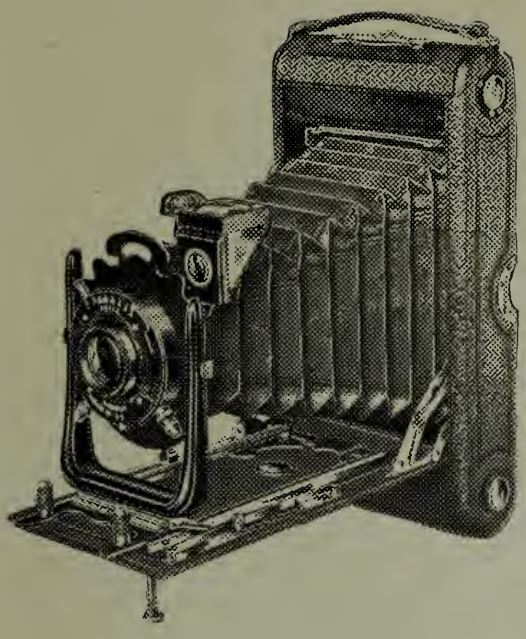
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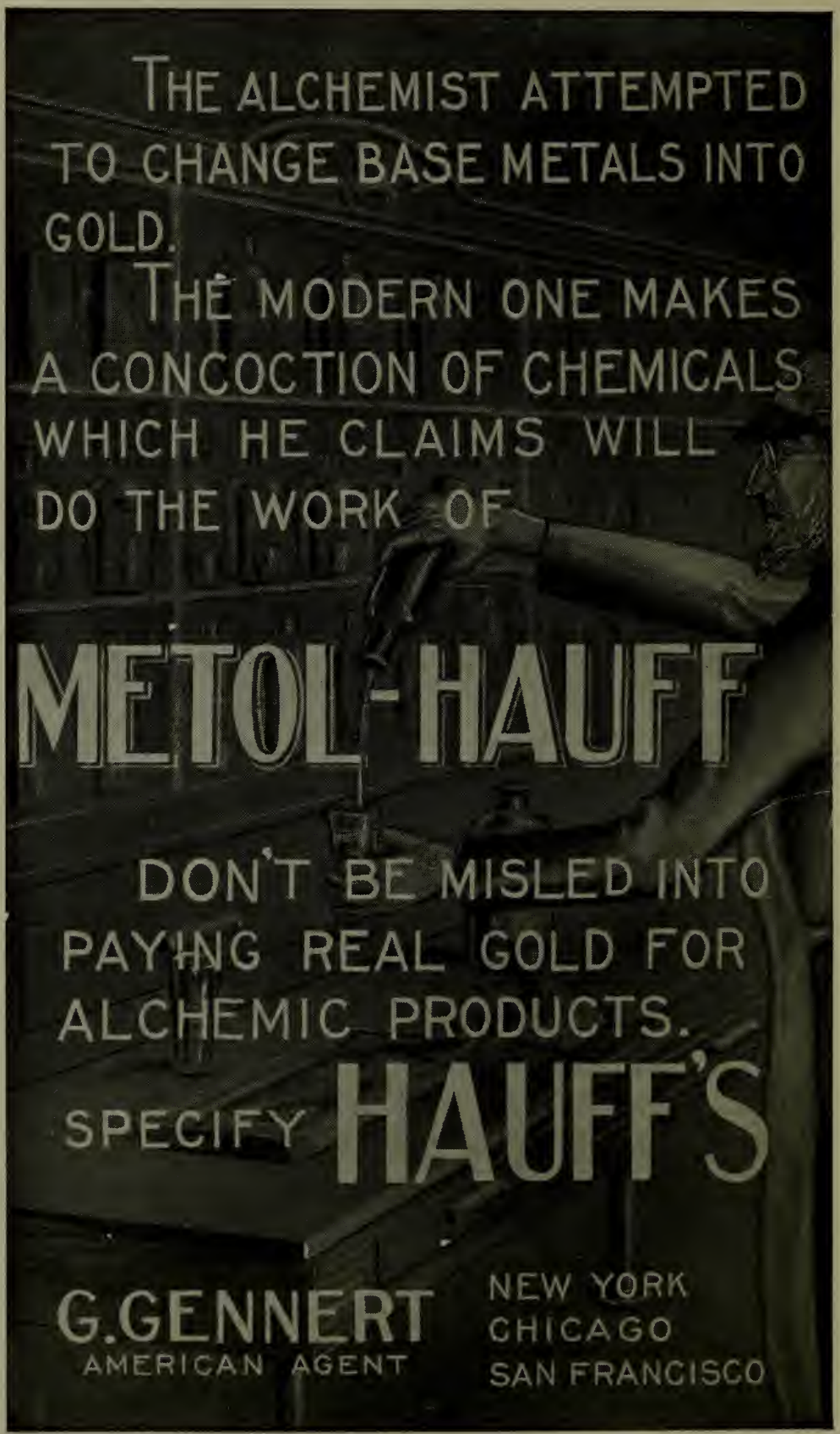
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